# THE IRON AGE

THURSDAY, MAY 17, 1888.

## The Dynamite Cruiser Vesuvius.

We take pleasure in presenting this week illustrations of the already much spoken of dynamite cruiser which was launched about two weeks ago by Messrs. Cramp & Sons, at Philadelphia, conjointly with the gunboat Yorktown. The Vesuvius, as this novel vessel has been named, is in many respects similar to the English torpedo cruisers, except that the torpedoes are discharged through the air instead of through the water, Lieutenant. Zalinski's pneumatic dynamite gun being used for the purpose.

The length of the ship between perpendiculars is 246 feet 3 inches; length over all, 252 feet 4 inches; breadth, 26 feet 5 inches; depth, 14 feet 1 inch; mean draft, 9 feet, and displacement, 725 tons. The vessel will be armed with three pneumatic dynamite guns of 10½-inch caliber, to throw shells containing 200 pounds of dynamite a distance of a mile, capable of being discharged once in two minutes. Ten dynamite projectiles will be carried for each gun. The range can be varied at will from 1 mile to 200 yards by varying the amount of air entering from the firing reservoir. The guns are not movable in the ship, but are fixed at an incline, so that for training the vessel must be turned, but as she has twin screws this will be readily accomplished. To insure the safety of the crew while handling the shells and loading and firing the guns, a light protective deck is worked over the lower parts of the guns, protecting the loading gear, compressors, &c. The conning tower raised above the spar-deck, and just in rear of the guns, is built of 1-inch plates, with a light hood on top. The vessel has steam steering apparatus. The guns are placed side by side in the forward part of the vessel, as shown in the plan. They are made in single sections with flange connections, their length in all being about 54 feet. The shells are fired by fuses igniting on impact or by fuses formed of a composition which ignites on being wet, so that the charge explodes after the shell sinks below the surface of the water. The shells containing the dynamite are projected by means of compressed air. There is a main reservoir down near the keel and a firing reservoir near the breech of the guns from which air is let into the guns in the rear of the projectile. The pressure in the main reservoir is about 2000 pounds. It is confidently expected that when this vessel is completed the United States will have in its possession a vessel capable of placing with considerable accuracy an aerial torpedo charged with a high explosive within the range of 2 miles. In addition to the three dynamite guns, a powerful secondary battery is carried, consisting of two 3-pounders, one 1-pounder, two 37 mm. revolving cannon, and two Gatlings.

The motive power will be furnished by two triple expansion engines developing about 3200 indicated horse-power. There are four cylinders to each engine. The high-pressure cylinder is 21½ inches in diameter, the intermediate 31, and the two low-pressure cylinders 34 inches. There are four boilers in independent fire rooms, about 19½ feet long and 9 feet in diameter; grate surface, 200 square feet. The speed is to be at least 20 knots.

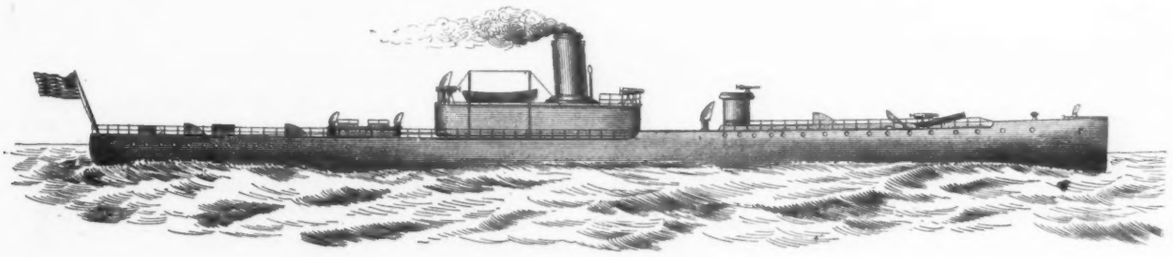


*Fig. 1.—General View.*

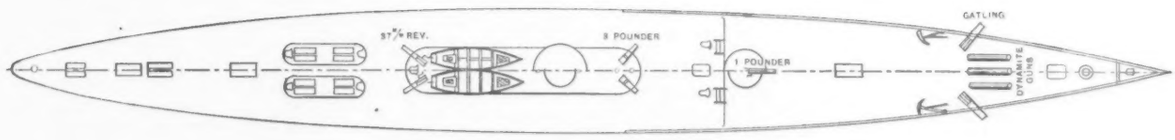



*Fig. 2.—Main Deck Plan.*

THE DYNAMITE CRUISER VESUVIUS, BUILT BY THE WILLIAM CRAMP & SONS' SHIP AND ENGINE BUILDING WORKS, PHILADELPHIA, PA.

The London *Ironmonger* refers to the recent testing of a cast-steel stern frame at the Newburn Steel Works (John Spencer & Sons) as follows: In order to test the soundness of the casting, which was in one piece and weighed 100 tons, one end was raised to an angle of 45° from the vertical, and on being released fell through a distance of 23 feet on to hard ground. It was then subjected to a drop test of 6 feet, and afterward, when suspended by an overhead crane, was struck with hammers to ascertain from its ring whether it had been injured by the tests. The test pieces, which had been previously marked and separated from the stern-frame, were then treated and gave satisfaction, the results being 15 tons per square inch elastic limit, 30 tons maximum strain, with 39 per cent. contraction of area, and 24 per cent. elongation in a length of 8 inches. Test pieces were bent through more than 90°; one piece, 1 inch diameter, was bent double without breaking, and afterward wedged open and broken, and then welded together, this being an item required by Lloyds.

## Estimating the Cost of Foundry Work.

To make a correct estimate of the actual cost of castings as they leave the foundry is, perhaps, one of the most difficult of the duties which devolve upon the engineer in charge of any manufacturing establishment. There are so many little expenses which can be determined only with the utmost difficulty, and which vary so constantly that many managers give up the task as a hopeless one, make a rough guess and establish an error at the very basis of all their calculations. We take special pleasure, therefore, in publishing practically in full a valuable paper on the subject, presented at the Nashville., Tenn., meeting of the American Society of Mechanical Engineers, by Mr. Geo. L. Fowler. In this paper Mr. Fowler outlines a plan which, we understand, he has used very successfully in his own practice.

The first point to determine, says Mr. Fowler, before developing any system of estimating is the basis to be employed about which all of the expenses shall cluster. If we take the weight, we are reduced to the old method of averaging all expenses at a certain rate per pound. It is evident, therefore, that the expense of molding is the basis upon which all estimates and calculations should be founded, coupled with a careful consideration of weights and the cost of iron and fuel.

For the sake of convenience, we may divide our expenditures under the heads of iron, wages to molders, and molding materials, as sand, blacking, coal dust, &c., the loss of iron consequent on melting, the expense of superintendence and repairs,

cost of cleaning, helpers, office and other current expenses and pattern making. The first step is to arrange the outlay under these various heads, and determine in what relationship they stand one to another. It is evident that the price of a piece of work which costs $2 per ton in molders' wages exerts a very different effect on the average cost of the output, from one costing $10, so that great care should be exercised in determining just what the actual expense of molding each individual piece may be; or, as we have already said, this is the principal factor in all of our calculation. These figures should be obtainable from the books of any well-regulated establishment; but they are not yet arranged, so that they can be used for the direct purposes of an estimate, since there should be a rearrangement and modification of those items which can in any way exert an influence upon the cost of any special articles which may be under consideration; whether they are dependent upon its weight or are in direct connection with the expense of molding it. A heavy casting may require little time or expense in molding it, and a light one a great deal; therefore those items which are particularly connected with the weight must be separated from those which relate to wages. We then formulate from the table which has been already prepared an auxiliary account, comprising: The cost of melting; a certain percentage which rises and falls with the expense of molding, and is independent of weight; a business factor, including maintenance of buildings, salaries, interest, &c. This latter is practically constant, though its ratio does rise and fall inversely with the increase and decrease of business. All of the expenses of the establishment are gathered around these two heads—namely: Weight and molders' wages. We see now that the expense of melting, including the cost of the iron and fuel, the service of the cupola, the clearing up of the drop, and the cleaning of the castings, are items directly connected with the weight, and that they are apt to vary, per pound, inversely with the total weight of castings produced, because the labor of preparing and serving the cupola, and the fuel used in making the bed is constant, leaving only the total of the remaining tolerably constant ratio of the several charges to bear the whole expense. Under the domain of the molders' wages, we bring all of the other expenses of the establishment. It may be true that there are some expenses which do not stand in a direct, actual constant ratio to the wages paid to the molders, but the variation from this ratio is so slight that no error will be introduced into our reckoning if we assume this constancy to be perfect. Thus we group about this item, the wages paid the helpers, salaries to clerks, expenses for superintendence, molding material, &c. This latter may appear to be misplaced at first sight, but careful observation has convinced the writer that the ratio is nearly constant. For those heavy and cheaply made molds, where the weight runs up into the thousands, take no more dressing, in the way of blackening, facings, &c., than the smaller and more elaborate molds which require many more times the amount of labor per 100 pounds than the heavier ones. This is the general plan, and we will now give a brief elaboration of the details, which will consist of obtaining the cost of the iron and the ratios existing between the molders' wages and the following items of expense—namely: molding materials, expense of superintendence, business expenses, depreciation of property, wages of helpers, and pattern making.

We have now grouped all of the expenses of the establishment about the two chief heads, molders' wages and the weight, to which they bear a certain ratio, and proceed to determine the amounts and proportions of the various minor items. First taking the expense of melting, we tabulate a schedule which will show the amount of wood used in starting the fire and heating the ladles, the coke and coal required in making the bed, the fire-brick and clay, expense for banking, rounding up and charging. These expenses are, or ought to be, nearly constant for each heat, as all of the items mentioned are required in the same amount, whether the heats be heavy or light. Add then the cost of the iron and fuel used and the expense of melting for a given heat is obtained. It will be readily understood that, given the expense of preparation and the amount of iron melted, with the ratio of the fuel used in the charging, the whole melting expense per ton of castings is ascertained in a few moments.

To determine the ratio of the molding materials to the wages of the molders, requires some time, months, in fact, at first; but when once obtained can easily be kept accurate by occasional reference to the books. It is best when starting out to use this formula, to refer to the books and take the ratio existing between the amount paid for facings, riddles, &c., and the molders' wages for two, three or more years, and adjust it from time to time by reference to current expenditures. This is, in fact, the only way practicable with any degree of convenience, for it would be a work of too great detail to weigh out all the articles actually consumed, and estimate the wear and depreciation on the tools for each heat. The ratio of the waste of iron to the total amount melted can only be determined by experience, and no absolute rule can be given for it, as the percentage varies with every cupola, and even with the kind of fuel and iron used, but when once determined it will be found to remain tolerably constant, and may be verified by dividing the weight of castings, scrap, sprues and shot for each heat by the total weight of iron melted, and subtracting the quotient from one.

We have now to deal with the most obscure of all our items of expense. It is that incurred by interest on borrowed capital, salaries of superintendents and clerks, office expenses, taxes, insurance, and, with the rest, that bugbear of all estimates—depreciation of property. The total of all of the items but the last is very easily obtained, while the last must be carefully estimated with due consideration for all of the surroundings. When this is done, it is best to make a studied review of the business for several years, learn what has been done, what was the average of the pay-roll for brisk times, dull times and when only a fair or medium business was being done. Take these three items and compare them with the present status and the probable total pay-roll for the coming year; this will give a ratio or percentage to be added to each and every dollar paid to the molders and should be of course incorporated in the expense of casting. To be sure to establish this ratio and make it exact is a work which should be thoroughly done, but, when once accomplished, it should be in such shape that a simple reference to our pay-roll, which will show whether we are doing a brisk, medium or a dull business, will determine which co-efficient should be used for the month. Thus far the assumption has been that the office expenses for the foundry are distinct; but where, as is almost universally the case, the foundry is connected with a blacksmith and machine shop, with possibly other departments, care should be taken to assign to the foundry only that portion of the general expenses which belong to it.

Finally we have to assign to its proper place an expense which the foundry must pay for and which is usually treated as a separate department. I refer to the expenses of the pattern shop. Where a shop is doing special work, this expense may consist of the repairs and construction of patterns for the various machines that are built and the labor and material therefor may be directly charged without burdening the foundry with them. But in most cases, especially in small works, where general work prevails, where patterns are altered and made to serve a variety of purposes, this, with the expense of flask repairs, must be put upon the foundry. Again, perhaps at the same time with this general work there may be a class of foundry work where the molding is done by machine and no expense is required for pattern repairs and none should be charged to it. The ratio of pattern repairs to molders' wages is then really easily determined, but it should be remembered that the foundry is to pay for no new patterns, but simply the depreciation on the same.

Having now tabulated our formula and established our ratios, it only remains to make the practical application thereof. To do this the time-keeper should each day take the time of each molder and the work upon which he has been engaged. This gives the basis to start upon. Add together the various ratios already determined, multiply by the wages paid; to this add the wages and the cost of the iron in the casting, and the cost of that casting is known. For example, suppose that 40 cents is paid for molding a grate-bar weighing 100 pounds; that the sum of the several ratios is 1.2, and that the cost of iron and fuel has been one cent per pound of castings, then:

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| Sum of all ratios multiplied by the molder's wages | $0.48 |
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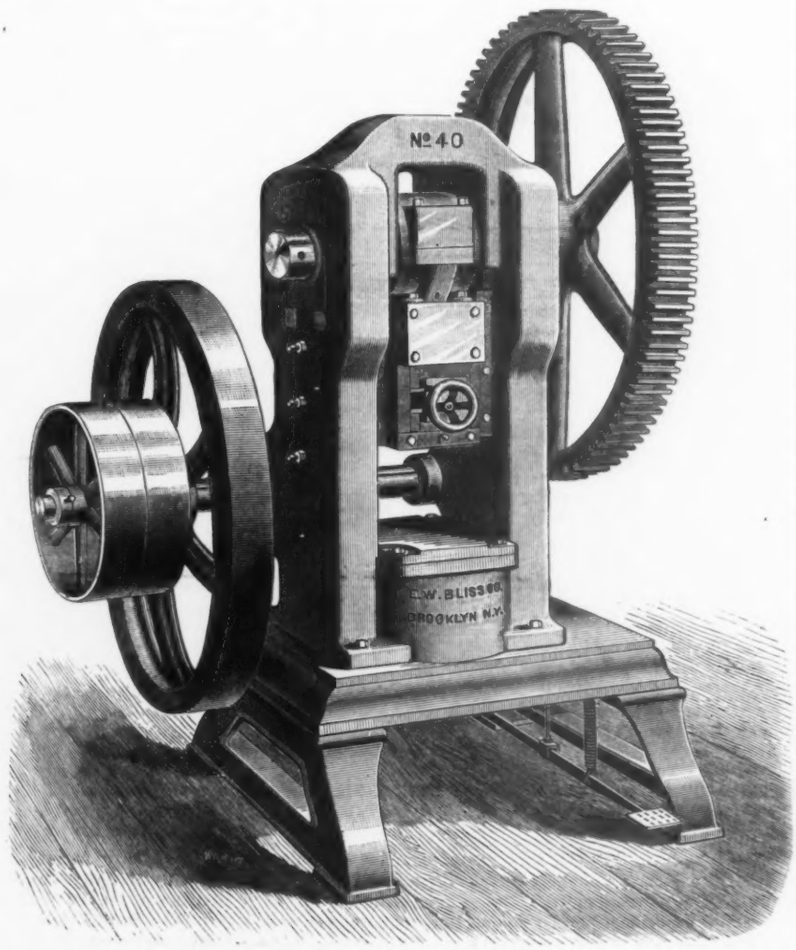
It must be remembered by those who are disposed to criticise the method here enunciated that there has been no space within the limits of this paper for any elaboration of detail. It is due both to myself and the originator of the plan, Herr A. Messerschmidt, of Essen, Germany, to say that he has used it in his own practice for 17 years, and that, though my own experience with it has been for a shorter time, I can say that it has more than come up to my expectations for accuracy and the ease with which it can be used. By adhering to its principles several unsuspected leaks have been discovered and stopped, and it has been possible to adjust prices more in accordance with the real value of the article sold than was possible before the plan was employed. To those who may object to its elaborateness I can say that an hour to an hour and a half suffices to work out the details of a heat of from 5 to 7 tons, and determine the cost to the manufacturer of each individual casting produced, and this when the output is composed of miscellaneous job castings, and that when the heat is entirely on line work the estimate can be made in from 15 to 20 minutes.

**Chemical Misnomers.**—The *Popular Science News* recites some of the curiosities of names of chemical compounds, which, when their inappropriateness is considered, appear extremely ludicrous. Thus: Oil of vitriol is no oil, neither are oil of turpentine and kerosene. Copperas is an iron compound, and contains no copper. Salts of lemon is the extremely poisonous oxalic acid. Carbolic acid is not an acid, but a phenol. Cobalt contains none of that metal, but arsenic. Soda water has no trace of soda, nor does sulphuric ether contain any sulphur. Sugar of lead has no sugar, cream of tartar has nothing of cream, nor milk of lime any milk. Oxygen means the acid maker, but hydrogen is the essential element of all acids, and many acids contain no oxygen. German silver contains no silver, and black lead no lead. Mosaic gold is simply a sulphide of tin.

This list might readily be extended, both in chemistry and other natural sciences, and it is only fair to state that these terms all come from the older writers, and tend to give way to a more scientific nomenclature.

### A New Geared Press.

The accompanying engraving illustrates a new single action press of great strength, especially designed for heavy cutting and forming operations in sheet steel, iron and brass, for embossing sheet brass, German silver, &c., and for watch-case work. The frame is made of a single casting with a space of 16 inches between the upright, a section of which at the smallest part measures 12 x 6 inches. The bed is 12 inches thick and may be cast solid for embossing work, or have an opening cored to allow blanks to drop through. The forged steel shaft has journal bearings 6 inches diameter by 6 inches long, and the crank for operating the pitman is 8 inches diameter by 10 inches long, occupying the total width between the journal bearings. The large spur wheel which drives the main shaft is 60 inches diameter by 6 inches width of face, runs continuously and is connected at will with the shaft by means of a very powerful clutching device, controlled by a treadle. The mandrel or slide is made in two parts, the main portion being 18 inches in length and fitted to slide in adjustable V-shaped gibbs attached to the inside of the press frame. The upper portion of this mandrel is planed out to receive that part connected with the pitman, which is an oblong box-shaped piece, held in place by a cap on the main part of the mandrel, yet allowed to move vertically for the purpose of adjustment. The two parts of the mandrel have a solid connecting device, which allows an adjustment of $\frac{7}{16}$-inch of its hight, and the whole makes a practically solid mass of metal from the shaft to the lower end of the mandrel. Tight and loose driving pulleys 24 inches diameter by 6 inches face, and a balance wheel 58 inches diameter by 5 inches face, weighing 1300 pounds, are mounted on one end of the back shaft, which is $3\frac{3}{4}$ inches in diameter. A webbed pinion on the opposite end of the back shaft drives the large spur gear, the proportion of gearing being $7\frac{1}{2}$ to 1. The press frame is mounted on a heavy iron table, and the total weight of the machine complete is 10,000. The press is built by the E. W. Bliss Company, of Brooklyn, N. Y. It is known as No. 40.




A NEW GEARED PRESS, BUILT BY THE E. W. BLISS COMPANY, BROOKLYN, N. Y.

### Viscosity Determinations of Lubricants.

At the Nashville meeting, last week, of the American Society of Mechanical Engineers Mr. J. E. Denton presented a paper of considerable interest, entitled, "The Mechanical Significance of Viscosity Determinations of Lubricants." Several forms of "viscosimeters," instruments for determining this property, were described, one of them, designed for the use of the Standard Oil Company, consisting of a bath of water, in which is held a vessel capable of holding 4 ounces of oil. The lower end of this vessel has an outlet about $\frac{1}{16}$ inch in diameter, so adjusted as to be as completely surrounded by the water-bath as possible. A small piece of glass is set into the lower part of the oil vessel, and the water-bath is of glass so that as the level of oil falls it finally comes into view, and the time of flow of the oil can be made to terminate at the instant when the oil reaches a line drawn at a particular point on the glass portion of the oil vessel. The temperature of the water-bath is adjusted by condensing steam in it. The oil vessel is filled to a desired point, and the time is noted which allows the oil to drop to the mark previously mentioned. In testing oils the interval in seconds, or viscosity, is recorded. A second form of viscosimeter was the same in principle, being used on the Chicago and Northwestern Railroad. A third form consisted of a cylindrical vessel in a proper heating bath, fitted with a piston. The vessel being filled with oil, the piston is drawn up until an eye in its rod is above the upper of two cross wires. The bath being at the proper temperature, the piston is released and begins to sink. When the eye passes the upper wire time is noted with a stop-watch, and the latter is stopped as the eye passes the lower wire. This interval of time is taken as the measure of viscosity. Both the cylinder and the piston are of glass. The piston is about $\frac{2}{1000}$ inch less in diameter than the cylinder. The cylinder is made with all the accuracy of bore that the highest optical talent can afford. This apparatus is so sensitive in its action that the viscosity of illuminating oils can be distinguished by its use. Its designer, Mr. C. M. Perkins, of the Atlantic Refinery, Philadelphia, has successfully applied the instrument to the explanation of the difference of illuminating effect of various kindred petroleum products which it is impossible to investigate with viscosimeters of the jet type on account of their far less sensitiveness.

Mr. Denton then submitted a table showing comparative results for given oils obtained by the use of the different viscosimeters. The figures showed a fairly satisfactory agreement, the discrepancies being of slight importance. The same oils were then applied to lubricate the slide of an upright condensing engine, 44 inches diameter 36 inches stroke, making about 80 revolutions with 70 pounds boiler pressure, with 90 square inches of area in the crosshead shoes on the working side of the slide. The slides were at a temperature of 167° F. Their surfaces, as they were uncovered by the shoes, could be closely observed and the thickness of oil tested by wiping the surface with the finger, sufficiently well to detect considerable variations of such thickness. The relative amounts of oil were then determined which were necessary to be supplied per minute to prevent the wear of the brasses of the crosshead shoe from causing black streaks to appear on the slide. From these figures Mr. Denton concluded that the possible saving in the oil consumption necessary for minimum wearing away of the rubbing surfaces, due to the difference in viscosity, proves that the most economical lubricant is the oil of the greatest viscosity which will permit the oil to be fed, wherever the loss of power in friction is an element of inferior importance, as is the case in all heavy machinery.

The progressive town of Pullman, near Chicago, is to have an electric railway, three miles in length, to run between Pullman and Kensington. It will be built on the Van Depoele system. The plans and specifications have been completed and the contract let, and when finished it will cost in the neighborhood of $100,000. The road will, it is expected, be in running order in about 90 days.

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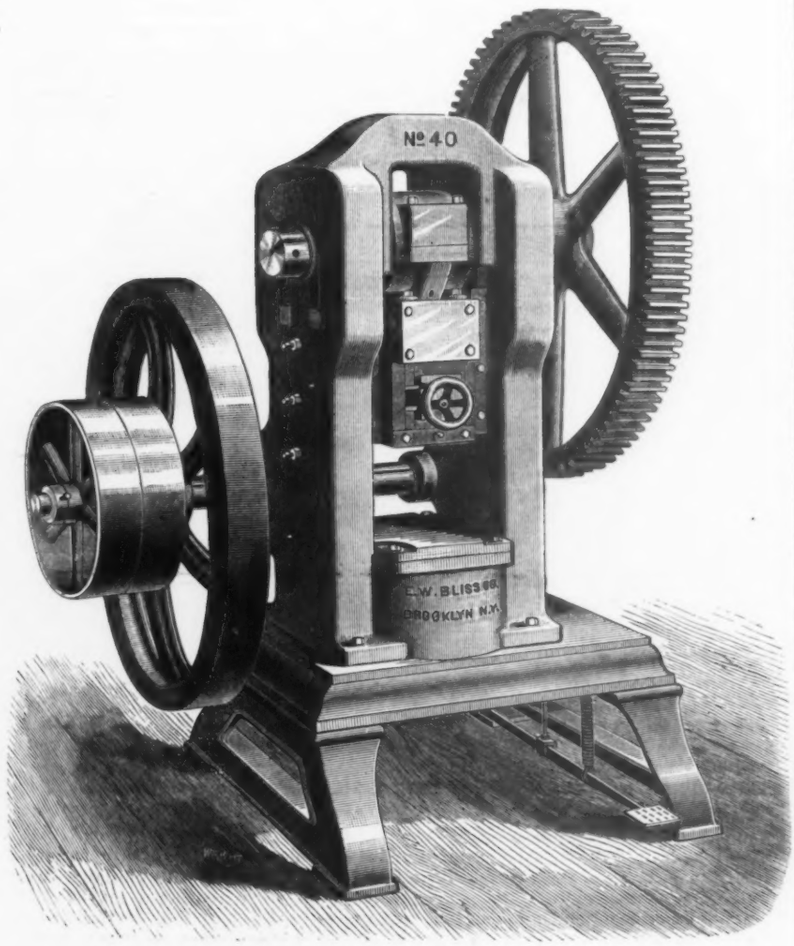
It must be remembered by those who are disposed to criticise the method here enunciated that there has been no space within the limits of this paper for any elaboration of detail. It is due both to myself and the originator of the plan, Herr A. Messerschmidt, of Essen, Germany, to say that he has used it in his own practice for 17 years, and that, though my own experience with it has been for a shorter time, I can say that it has more than come up to my expectations for accuracy and the ease with which it can be used. By adhering to its principles several unsuspected leaks have been discovered and stopped, and it has been possible to adjust prices more in accordance with the real value of the article sold than was possible before the plan was employed. To those who may object to its elaborateness I can say that an hour to an hour and a half suffices to work out the details of a heat of from 5 to 7 tons, and determine the cost to the manufacturer of each individual casting produced, and this when the output is composed of miscellaneous job castings, and that when the heat is entirely on line work the estimate can be made in from 15 to 20 minutes.

**Chemical Misnomers.**—The *Popular Science News* recites some of the curiosities of names of chemical compounds, which, when their inappropriateness is considered, appear extremely ludicrous. Thus: Oil of vitriol is no oil, neither are oil of turpentine and kerosene. Copperas is an iron compound, and contains no copper. Salts of lemon is the extremely poisonous oxalic acid. Carbolic acid is not an acid, but a phenol. Cobalt contains none of that metal, but arsenic. Soda water has no trace of soda, nor does sulphuric ether contain any sulphur. Sugar of lead has no sugar, cream of tartar has nothing of cream, nor milk of lime any milk. Oxygen means the acid maker, but hydrogen is the essential element of all acids, and many acids contain no oxygen. German silver contains no silver, and black lead no lead. Mosaic gold is simply a sulphide of tin.

This list might readily be extended, both in chemistry and other natural sciences, and it is only fair to state that these terms all come from the older writers, and tend to give way to a more scientific nomenclature.

### A New Geared Press.

The accompanying engraving illustrates a new single action press of great strength, especially designed for heavy cutting and forming operations in sheet steel, iron and brass, for embossing sheet brass, German silver, &c., and for watch-case work. The frame is made of a single casting with a space of 16 inches between the upright, a section of which at the smallest part measures 12 x 6 inches. The bed is 12 inches thick and may be cast solid for embossing work, or have an opening cored to allow blanks to drop through. The forged steel shaft has journal bearings 6 inches diameter by 6 inches long, and the crank for operating the pitman is 8 inches diameter by 10 inches long, occupying the total width between the journal bearings. The large spur wheel which drives the main shaft is 60 inches diameter by 6 inches width of face, runs continuously and is connected at will with the shaft by means of a very powerful clutching device, controlled by a treadle. The mandrel or slide is made in two parts, the main portion being 18 inches in length and fitted to slide in adjustable V-shaped gibbs attached to the inside of the press frame. The upper portion of this mandrel is planed out to receive that part connected with the pitman, which is an oblong box-shaped piece, held in place by a cap on the main part of the mandrel, yet allowed to move vertically for the purpose of adjustment. The two parts of the mandrel have a solid connecting device, which allows an adjustment of $\frac{7}{16}$-inch of its hight, and the whole makes a practically solid mass of metal from the shaft to the lower end of the mandrel. Tight and loose driving pulleys 24 inches diameter by 6 inches face, and a balance wheel 58 inches diameter by 5 inches face, weighing 1300 pounds, are mounted on one end of the back shaft, which is $3\frac{3}{4}$ inches in diameter. A webbed pinion on the opposite end of the back shaft drives the large spur gear, the proportion of gearing being $7\frac{1}{2}$ to 1. The press frame is mounted on a heavy iron table, and the total weight of the machine complete is 10,000. The press is built by the E. W. Bliss Company, of Brooklyn, N. Y. It is known as No. 40.




A NEW GEARED PRESS, BUILT BY THE E. W. BLISS COMPANY, BROOKLYN, N. Y.

### Viscosity Determinations of Lubricants.

At the Nashville meeting, last week, of the American Society of Mechanical Engineers Mr. J. E. Denton presented a paper of considerable interest, entitled, "The Mechanical Significance of Viscosity Determinations of Lubricants." Several forms of "viscosimeters," instruments for determining this property, were described, one of them, designed for the use of the Standard Oil Company, consisting of a bath of water, in which is held a vessel capable of holding 4 ounces of oil. The lower end of this vessel has an outlet about $\frac{1}{16}$ inch in diameter, so adjusted as to be as completely surrounded by the water-bath as possible. A small piece of glass is set into the lower part of the oil vessel, and the water-bath is of glass so that as the level of oil falls it finally comes into view, and the time of flow of the oil can be made to terminate at the instant when the oil reaches a line drawn at a particular point on the glass portion of the oil vessel. The temperature of the water-bath is adjusted by condensing steam in it. The oil vessel is filled to a desired point, and the time is noted which allows the oil to drop to the mark previously mentioned. In testing oils the interval in seconds, or viscosity, is recorded. A second form of viscosimeter was the same in principle, being used on the Chicago and Northwestern Railroad. A third form consisted of a cylindrical vessel in a proper heating bath, fitted with a piston. The vessel being filled with oil, the piston is drawn up until an eye in its rod is above the upper of two cross wires. The bath being at the proper temperature, the piston is released and begins to sink. When the eye passes the upper wire time is noted with a stop-watch, and the latter is stopped as the eye passes the lower wire. This interval of time is taken as the measure of viscosity. Both the cylinder and the piston are of glass. The piston is about $\frac{2}{1000}$ inch less in diameter than the cylinder. The cylinder is made with all the accuracy of bore that the highest optical talent can afford. This apparatus is so sensitive in its action that the viscosity of illuminating oils can be distinguished by its use. Its designer, Mr. C. M. Perkins, of the Atlantic Refinery, Philadelphia, has successfully applied the instrument to the explanation of the difference of illuminating effect of various kindred petroleum products which it is impossible to investigate with viscosimeters of the jet type on account of their far less sensitiveness.

Mr. Denton then submitted a table showing comparative results for given oils obtained by the use of the different viscosimeters. The figures showed a fairly satisfactory agreement, the discrepancies being of slight importance. The same oils were then applied to lubricate the slide of an upright condensing engine, 44 inches diameter 36 inches stroke, making about 80 revolutions with 70 pounds boiler pressure, with 90 square inches of area in the crosshead shoes on the working side of the slide. The slides were at a temperature of 167° F. Their surfaces, as they were uncovered by the shoes, could be closely observed and the thickness of oil tested by wiping the surface with the finger, sufficiently well to detect considerable variations of such thickness. The relative amounts of oil were then determined which were necessary to be supplied per minute to prevent the wear of the brasses of the crosshead shoe from causing black streaks to appear on the slide. From these figures Mr. Denton concluded that the possible saving in the oil consumption necessary for minimum wearing away of the rubbing surfaces, due to the difference in viscosity, proves that the most economical lubricant is the oil of the greatest viscosity which will permit the oil to be fed, wherever the loss of power in friction is an element of inferior importance, as is the case in all heavy machinery.

The progressive town of Pullman, near Chicago, is to have an electric railway, three miles in length, to run between Pullman and Kensington. It will be built on the Van Depoele system. The plans and specifications have been completed and the contract let, and when finished it will cost in the neighborhood of $100,000. The road will, it is expected, be in running order in about 90 days.

## Keep's Tests for Foundry Iron.*—II.

1. *The Weight Machine.*—The test-bar used being exactly 1 foot long and the bearings being exactly 1 foot apart, the ends of the bar are clamped in small extension pieces made of tempered steel, shown in Figs. 16 and 17. If a blow-hole or a flaw exists in any bar a clamp is placed over the defect. A plate carrying the supports for the bar is placed on the bed-plate of the machine so that the test-bar shall come exactly under the beam of the machine and the center of the bar under the pressure-post D. Figs. 16 and 17 show this machine. It consists of a beam, B, moving on a knife-edge (marked 10). Forward from this 1 dm. is another knife-edge (17), which transfers the weight to D. A saddle, A, weighing 50 pounds, travels on the beam B, its center of gravity corresponding with the knife-edge (10) when its weight is pulled to the near extreme. The beam is balanced by a weight, Q, so that when A is clear back it exerts no weight on D. When the weight is over D it exerts a pressure on D of exactly 50 pounds, and each forward motion of a decimeter adds a pressure of 50 pounds. The capacity of the machine is 600 pounds, which is more than is required for cast-iron. The perpendicular rise of D is ½ inch, and it begins at its upper limit, so that the breaking of the test bar shall be when the beam is near the horizontal. The wheel W is turned by means of a crank and thus propels the steel cord K, which carries with it the weight A,

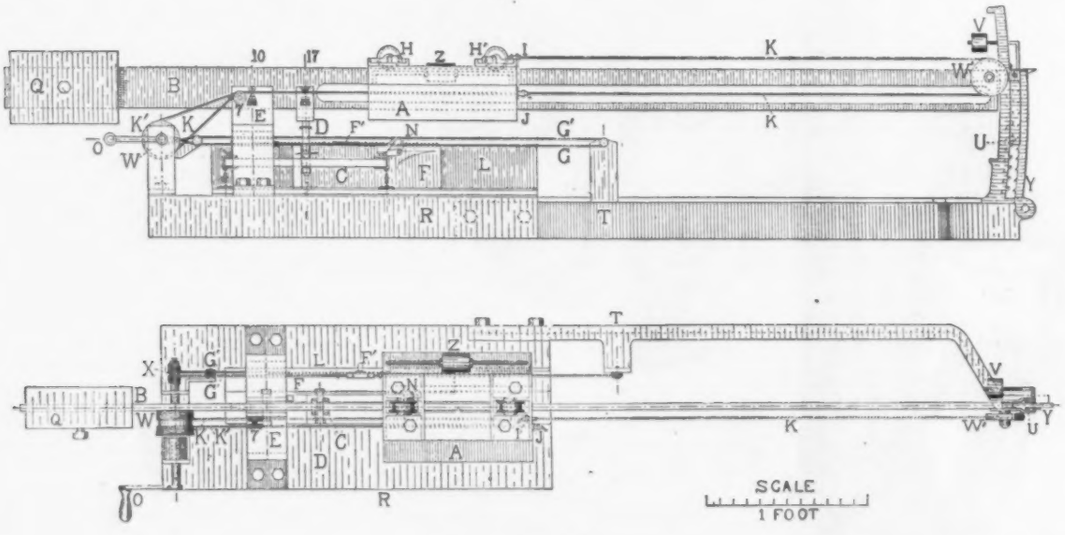
On the same shaft is another smaller wheel (X), which carries another steel cord (G) which moves in the same direction, but only over one-fourth the distance. This cord is employed to impart motion to a portion of an automatic arrangement for recording the deflection. To this cord (G) is attached a paper-holder, which moves with it and on which is fastened a sheet of paper. Attached to the underside of the beam, at a point 5 dm. forward from the knife-edge (10), a pencil can be attached, whose point is pressed against the paper. By this arrangement the deflection is multiplied five times and is recorded on the paper. The weight is also recorded at the same time; but, as the board moves only one-fourth of the distance traversed by the weight, and as 1 dm. on the large beam corresponds to an alteration of 50 pounds, it follows that on the diagram 50 mm. represents a weight of 100 pounds. The use of steel ribbons (10 and 17) to hold the knife-edges on their bearings does not detract from the sensitiveness of the machine. At the forward end of the machine is a series of steps and attached to the end of the beam is a dog, which, by means of a spring, allows the beam to descend without friction while the machine is weighing; but the instant the test-bar breaks the dog drops into the next step and remains there. For foundry practice this is all that is required, and, if preferred, the weight can be read from the upper graduated edge of the beam. For more accurate work a recorder is used, as shown in all Figs. 16 to 24, also 32 to 34. In this machine nearly all the parts are of sheet metal, and, by means of a parallel motion, the pencil is caused to describe a perpendicular line.

2. *The Impact Machine.*—An iron frame carries sockets at the top which support a swinging weight (A) of 25 pounds. The radius arm is a light trussed rod. The bed-plate and frame and anvil (N) form a resistance much in excess of that actually required. The test-bar is set on supports just as in the weight machine, but for accurate work the recording device, shown in the figures previously referred to, is used. The weight A is raised by means of the operator's left hand, the handle O being held until the catch T takes hold of it. By pressing the trigger R the weight A is released and delivers its blow through the steel hammer W upon the light hollow slide E, which rests directly on the bar (or in the cage of the recorder if this is used). The blow is thus communicated to the center of the test-bar. While the weight is swinging and delivering its blow the operator moves the catch T up to the next ½-inch notch, so that each blow is delivered ½ inch higher than the preceding one. The first blow is always struck from ½ inch and each succeeding blow increases by ½ inch. By beginning at ½ inch (which is lower than the weakest foundry iron) all bars receive as nearly as possible the same treatment. The fall of the breaking blow is shown by the position of the catch on the scale when the blow was struck, and a reference to the table mentioned gives the value of the blow in pounds.

*A paper read before the South Staffordshire Institute of Iron and Steel Works Managers by W. J. Keep, C. E., Detroit, Mich., U. S. A. Revised and communicated by Thomas Turner, associate R. L. M., Mason College, Birmingham.

## New Light Forgings Factory at Chicago.

The Vaughan & Bushnell Mfg. Company, of Chicago, have just completed a new factory at 81, 91, 93 and 95 South Clinton street, for the manufacture of light forged hardware and tools, which is well worthy of special mention. Their business, which has been long established, had outgrown the facilities of their old factory at 106 and 108 West Randolph street, and after an examination of various sites they determined upon the new location above referred to as the most desirable point for the erection of a building large enough to cover their present and prospective needs, and close enough to the business center of the city to answer the requirements of an




*Figs.* 16 *and* 17.

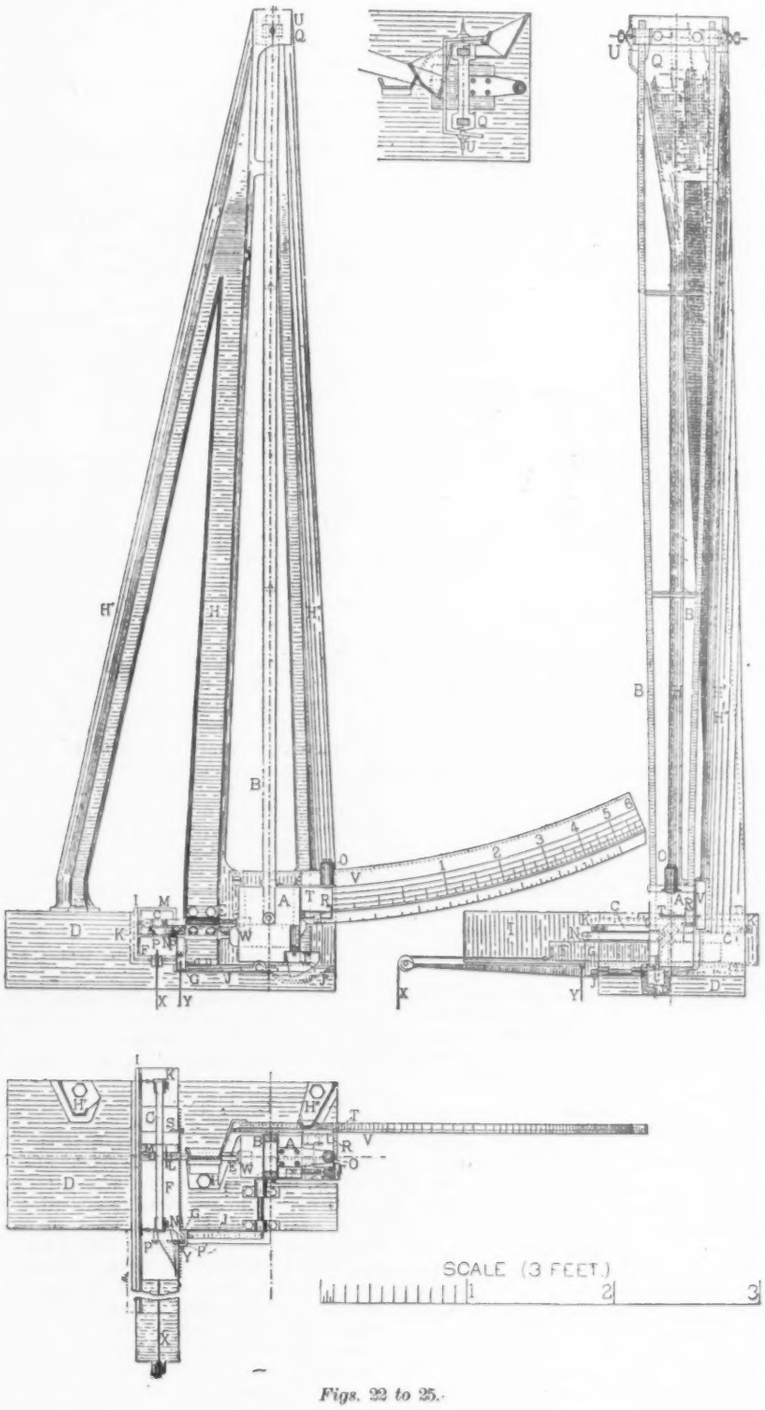
ELEVATION AND PLAN OF TRANSVERSE MACHINE.

office and salesroom as well as a factory. The building is very substantially constructed of brick, covers a lot 80 feet square, and consists of four stories and a basement, having numerons windows on all four sides. The design of the building is peculiar, being specially adapted to the nature of the business. The street floor is used for the office and salesroom, extending to the depth of half the building, or 40 feet. The forging department is immediately below in the basement, the front part of which is 11 feet high while the rear is open to the second floor back of the office, having a ceiling 24 feet high. The extra hight in the rear is for the purpose of making room for the larger classes of machinery used, and also to enable the work of forging to be carried on with an abundance of light, and as much comfort to the workmen as possible.

In the front part of the basement the engine and boiler are located. A 70-horse power Reynolds-Corliss engine is used, and steam is supplied from a steel tubular boiler, 54 inches by 18 feet. The boiler will also supply steam for heating the entire building. Two Stiles & Parker presses are used for cutting material to lengths. Seven forge fires, two Bradley hammers, two drop forges and one steam hammer are now in use, but more machinery will be added shortly to the forging department to bring its capacity up to the requirements

of the company's trade. The machine shop occupies the whole of the second floor, being lighted with windows on all sides. The usual equipment of lathes, planers, drills, shapers, &c., is here congregated, together with machines of special design for making meat hooks, &c., and emery wheels for polishing. Ten polishers are employed. An exhaust fan connects by a pipe with each wheel and conducts all dust away from the operators, depositing it outside the building. The third floor is used for stock and storage, while the fourth floor is equipped with a tinning plant for finishing such goods as require a coating of tin. The working force at present comprises 50 men in all departments. Easy communication with all the floors is secured by a Crane elevator, with a platform 6 x 8 feet, and capable of carrying a load of 2 tons. The elevator is located at the side of the building, and occupies a brick shaft. Iron doors close it completely on each floor, while it is lighted with windows in the outside wall of the building. Iron shutters are used on the side windows of the building as a precaution against an external fire, although the building is isolated from its neighbors by a 16-foot alley, which serves also as a very convenient means for receiving and shipping through a side door close to the elevator. The entire structure is shortly to be wired for electric lighting.

The office and salesroom on the first floor are finished in oiled Georgia pine. Glass partitions separate the clerical force from the other occupants of the room, while several rows of shelving and bins are arranged in symmetrical order between the posts supporting the upper floors, to carry samples and stocks of goods. The products turned out by this company embrace a very extensive line, all of which are forged, no castings being used. They make a full line of blacksmiths' tools, except hammers and sledges. High quality is specially aimed at. A fine specimen of their work is a farrier's cutting nippers with a perfectly fitting joint and removable bolt, made of high-grade solid steel drop-forged, its jaws fitting true from edge to edge and cutting nails or wire with perfect ease and without injury to the tool. They also make tinners' tools in great variety, wrought leader-hooks drop-forged in one piece, butchers' and packers' goods, cotton and hay hooks, punches and countersinks, cold chisels and other small forged steel goods. The groundwork of their business for the past 17 years has been the manufacture of post-hole augers, which is still continued and is increasing, notwithstanding the competition of newly patented designs. The sizes made range from 4 to 14 inches. From 1800 to 2000 dozen are annually sold by this company. Their trade in their several lines extends throughout the country. At the present time they are working on orders from both New York and San Francisco.




*Figs. 22 to 25.*

THE IMPACT MACHINE.

## England's Iron and Steel Production.

Through the courtesy of Mr. Jeans, the secretary of the British Iron and Steel Institute, the *Bulletin* of the American Iron and Steel Association prints the following statistics of British iron and steel production for 1887:

The total quantity of pig iron produced in Great Britain in 1887, including spiegeleisen and ferromanganese, was 7,441,927 gross tons, against 6,870,665 tons (according to Mr. Jeans) in 1886, an increase of 571,262 tons. In the United States the increased production of pig iron in 1887 over 1886 was 733,819 gross tons, or 162,557 tons more than in Great Britain. At the close of 1886 the stocks of unsold pig iron in Great Britain amounted to 2,491,506 gross tons, and at the close of 1887 they amounted to 2,616,366 tons, an increase of 124,860 tons. The stocks held at the close of 1887 were the largest in the history of the British iron trade.

The production of Bessemer steel ingots in Great Britain in 1887 was 2,064,403 gross tons, which was an increase of 493,883 tons on the production of 1,570,520 tons in 1886.

The production of Bessemer steel rails in Great Britain in 1887 amounted to 1,021,847 gross tons, against 730,343 tons in 1886, an increase of 291,504 tons. The production of Bessemer steel rails by Great Britain in 1887 was less than half that of the United States, the latter country having produced in that year from ingots made in its own works 2,044,819 gross tons of Bessemer steel rails.

The production of open-hearth steel in Great Britain in 1887 amounted to 981,104 gross tons, an increase of 286,954 tons on the production of 694,150 tons in 1886.

The production of steel by all processes in Great Britain and the United States in 1887 was as follows, in gross tons:

| Ingots. Gross tons. | Great Britain. | United States. |
|---|---|---|
| Bessemer steel..... | 2,064,403 | 2,936,033 |
| Open-hearth steel.... | 981,104 | 322,069 |
| Crucible steel..... | about 100,000 | 75,376 |
| Other steel.....nominal if any | | 5,593 |
| Total..... | 3,145,507 | 3,339,071 |

In 1886 the United States surpassed Great Britain in the production of steel by 197,832 gross tons, and in 1887 this leadership in production was maintained.

## The Canadian Transcontinental Railway.

The report of the annual meeting of the Canadian Pacific Railway, held in Montreal on the 9th inst., is a remarkable document, if for no other reason than as showing how Anglo-Saxon enterprise triumphs in achievement and under difficulties which the incredulous had pronounced insurmountable, in spite of a subsidy of $25,000,000, the present of 700 miles of unfinished road and a gift of 25,000,000 acres of land. Within three years the gross earnings of this great transcontinental highway have advanced from less than $8,500,000 to $11,606,412—freight earnings amounting to $6,924,000 for the year just expired, as against $6,112,000 for the previous year; and this result, despite the unusual severity of the past winter, which crippled business, also a serious deficiency in the grain crops of Ontario and the inadequacy of the elevators and other appliances at command for handling the traffic that was offered in the Northwest. The net earnings, therefore, were only $3,504,118, and, deducting the fixed charges of $3,250,263, leave a surplus of only $253,854. Bearing in mind the fact that the transcontinental line of the Canadian Pacific was opened for traffic no longer ago than July, 1886, and that as its connections and terminal facilities were in the beginning of their development, it must be conceded that some success has been realized thus far in the career of a great enterprise seemingly quite disproportioned to the resources of those by whom it was undertaken.

All indications point to a continued increase of traffic, local, transcontinental and foreign, though the final surplus may remain small. Its rivals on the United States boundary line cannot ignore the fact. During the past years, as stated by Mr. Van Horn, vice-president and general manager, "the transcontinental traffic, taken in connection with the American lines, did not reach 2 per cent. of the entire business." In the future, however, the company are expecting to possess the advantages of a first-class steamship line to Yokohoma and Hong Kong, the imperial Government having decided to grant a subsidy of $300,000 per annum for this purpose. And in regard to the local traffic, which last year formed 98 per cent. of the total, the Canadian line reasonably expect to profit from the operation of the Interstate law, which, to some extent, tied the hands of their rivals across the boundary line. The report to the annual meeting in Montreal expresses satisfaction in the more profitable business done since last November, when the American lines agreed to restore and maintain the rates current prior to the general scramble for Northwestern business.

After all, it is to the connections about to be made with the United States system of railroads, by means of its extensions to the bridge at Sault Ste. Marie, that attention will be directed with lively interest. The Minneapolis, Sault Ste. Marie and Atlantic Railway will be ready for traffic in a few days, and the not less important extension from Sault Ste. Marie to Duluth will be in full working order before August.

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E. W. L. Biermann, of Hanover, Germany, calls our attention to the fact that he has for many years made a specialty of the production of rare alloys and metals for producing special grades of iron, steel and bronze. He makes ferrotungsten cast in ingots, running from 20 to 57 per cent.; ferrosilicon-manganese, ferrotungsten-manganese, 5 to 10 per cent.; ferro-aluminium, 8 to 18 per cent.; ferrosilicon, 5 to 45 per cent.; ferrochrome, 10 per cent.; ferromolybdenum, ferrophosphorus, and 5 per cent. ferrotitanium. He produces also manganese copper and manganese bronze, silicon copper and silicon bronze, alloys of tungsten, cobalt, nickel and phosphorus, with copper, aluminium, bronze, silicon-manganese bronze, nickel bronze and phosphorus bronze. He manufactures Woods' metal, having a fusing point of 73° C., and Rose's metal with 94° C. as the melting point.

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## New Bench Drill.

The Pratt & Whitney Company, of Hartford, Conn., are bringing out a No. 1 bench drill for drilling holes of ½ inch and smaller diameters. The engraving which we annex explains its construction. The steel spindle, ⅝-inch diameter, can be given a vertical movement of 2½ inches by means of a lever, which carries an adjustable counterbalancing weight. The spindle, sliding through the long hub of the driving pulley, is driven by a ¼-inch round belt passing under idler pulleys that are adjustable to take up the stretch of the belt. The table, 7 inches in diameter, has a vertical adjustment of 4¾ inches, and can be clamped at any point from 7¾ to 3 inches from the bottom of the spindle. The center of the table is 4½ inches from the front of the upright. A countershaft furnished with the machine has 4 x 2¼ inch tight and loose pulleys, which should make 150 revolutions per minute when a ½-inch drill is used, and 600 revolutions when a $\frac{1}{16}$-inch drill is used. The weight of the machine and countershaft is 85 pounds.



*Bench Drill, Made by the Pratt & Whitney Company, Hartford, Conn.*

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No other than the horizontal engine for screw ships was used for many years in war ships on account of the necessity for complete protection, and the efficiency of the machinery arrangements was thus much reduced. Within the last few years, however, in large battle ships and some others it has been found possible to sufficiently protect the cylinders of vertical engines from danger by projectiles, and this type of engine has in all such cases invariably been fitted The advantages gained by the use of the vertical engine instead of the horizontal are very considerable, the engine working far more smoothly, wearing more evenly, and all parts being much more accessible for examination and repair.

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In its ordinary condition, sulphur is one of the best insulators—*i.e.*, one of the worst conductors known. M. Duter, in some experiments at the Sorbonne Laboratory, has, however, shown that when raised to its boiling point—about 836° F.—sulphur is capable of transmitting an appreciable current of electricity. With electrodes of gold, connected to a battery of Leyden jars, a current was obtained having the mean value of $\frac{1}{8000}$ ampere.

# NEW PUBLICATIONS.

THE OFFICIAL RAILWAY LIST, 1888. Size, 4½ x 8 inches; 271 pages. Published by the Railway Purchasing Agent Company.

The convenience and value attached to the Official Railway List need be given no special prominence at this time, having become generally recognized within the past few years. Every edition, and the present one is no exception, has been full of important information to which every railway official has occasion to turn at times, and the convenient way in which it has here been classified favorably commends itself. For those who have not heretofore been acquainted with the publication, we will explain that it is a complete directory of the officers of the different railways in North America, giving also the lengths of lines operated, gauge, number of cars, locomotives, &c. In addition to all this railway men will find in it useful information of a miscellaneous character, such as various standards of the Master Mechanics' Association, screw thread standards, handy tables for wind pressures, tank capacities, &c. The list has been carefully corrected up to April 1, 1888.

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THE TESTING OF MATERIALS OF CONSTRUCTION. By W. C. Unwin. Size 6 x 9 inches. 488 pages. Published by Longmans, Green & Co Price, $7.

Whatever imperfections and, in some respects, lack of completeness there may be in Professor Unwin's new work, it will rank as an exceedingly valuable one in every engineer's library. So far as we are aware there is no other book which attempts to cover the important ground selected by him, a fact in itself sufficient to make the volume sought after, and if we couple with this Professor Unwin's characteristic, graphic method of presenting the main points involved in engineering subjects, it seems safe to predict a very wide recognition of the advantages which it offers. A knowledge of the methods of testing materials has steadily increased in importance, and with the considerable advances which have been made in the construction of all the apparatus used in the work, engineers have, no doubt, frequently been annoyed and temporarily embarrassed by not having some work of reference which would help them out in the case of forgotten details. This evident want, and much more in addition, Professor Unwin supplies in an admirable manner.

Strictly speaking, the treatise may be divided into three distinct parts. In the first, taking up three chapters, the mechanical properties of materials are treated of—that is, the phenomena of elasticity and plasticity—and considerable attention is given to strain diagrams, methods of plotting being explained and the diagrams themselves analyzed so that the reader may be expected to be in position to correctly interpret them. The second part of the book, beginning with Chapter IV, is devoted to descriptions of apparatus used in the testing laboratory. Testing machines, in the ordinarily accepted sense of the term, naturally come first, the general principles involved in their construction and the requirements which they should fulfill, being presented in the opening pages. Then follow illustrations and descriptions of special makes of machines, the principal types only being selected. Among these we find, first, the testing machine at St. Chamond, France, probably the simplest of all in arrangement, the test piece being held between a shackle attached to a horizontal weighing lever above, and the ram of a hydraulic press below, the weighing of the stress being effected by the familiar method of rolling out a weight along the lever. The Fair-

banks, Thomasset, Maillard and Werder machines and also that of the Grafenstaden Company, at Mulhouse, are then briefly outlined. After these came the Woolwich Dockyard 100-ton machine, the Creusôt 30-ton and the St. Chamond 50-ton machines, and that designed by Fairbairn and one by Major Wade for testing cast iron for guns. Well executed plates are given, illustrating a 100-ton machine built by the English firm, Messrs. Buckton & Co., of Leeds, the Olsen and the Grafenstaden machines, these two being shown together for the purpose of comparison, and the far-famed Watertown machine. A description is also given of the 600-ton machine erected at Athens, Pa., a short time ago by the Union Bridge Company. The engravings in all cases represent not only general views, but sections and elevations showing all the essential features. Separate chapters are devoted to shackles for holding test bars, the different forms of measuring instruments, and finally autographic testing apparatus, the last concluding this particular section.

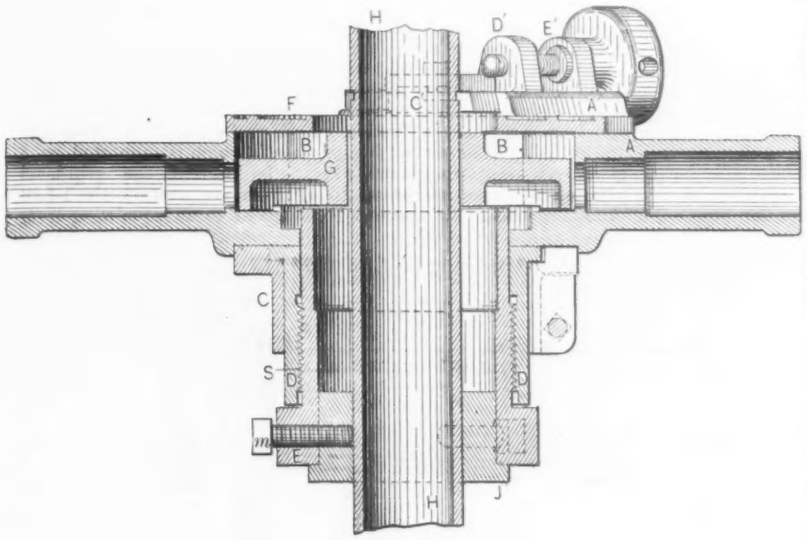



*Fig. 1.—Vertical Section.*

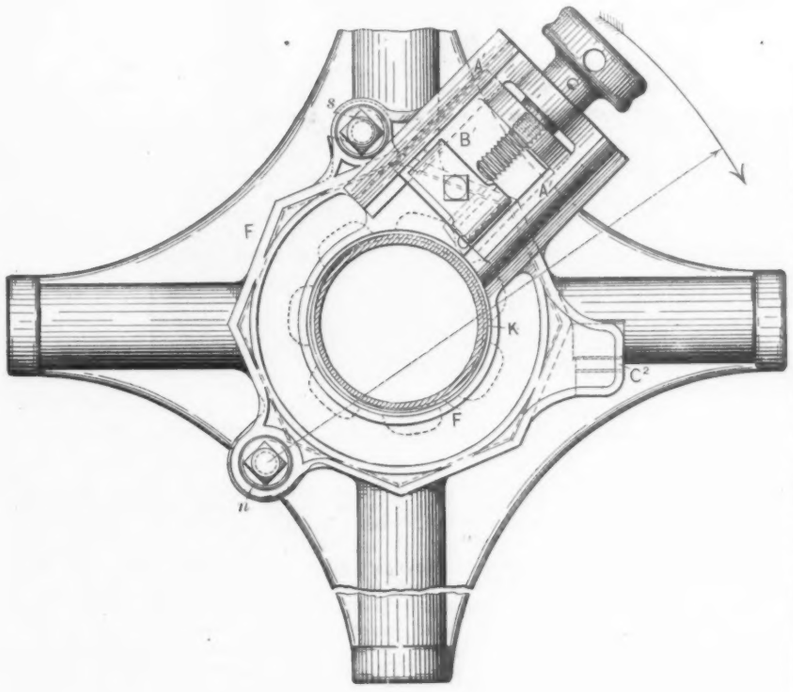



*Fig. 2.—Top View.*

AN IMPROVED DIE STOCK, MADE BY D. SAUNDERS' SONS, YONKERS, N. Y.

The third division of the work contains a collection of the most complete and trustworthy results of testing of all the ordinary materials of construction. Beginning with a chapter on the elastic constants for metals, Professor Unwin takes up successively cast iron, iron and steel, copper, copper alloys and miscellaneous tests of metals. The chemical and mechanical properties are reviewed, and extensive and carefully compiled tables of test figures are given. Chapter XII. refers to experiments on repetition of stress or endurance tests, and will, we think, be dwelt upon with special interest. The machinery described there was designed by Wöhler with the view of testing materials under conditions approximating as closely as possible to those arising in practice, and his results and conclusions from a twelve years' series of experiments which are given may be studied with profit. Results are also given of similar tests by Professors Bauschinger, of Munich, Spangenberg and others. Chapters on timber, stone and brick and limes and cements constitute the concluding portion of the book, and in these essentially the same method of treatment is pursued as that already mentioned.

In closing, we cannot but again emphasize the importance of Professor Unwin's work, and cheerfully commend it to the engineering profession. Typographically also it is of a high grade of excellence, superior to any other book on engineering that we have seen for a long time.

## The Saunders Improved Die Stock.

Messrs. D. Saunders' Sons, of Yonkers, N. Y., have just introduced an improvement in their already well-known die stocks, the engravings which we publish on this page showing the new design. In the main the improved stock is similar to their Nos. 4 and 5 with leader screw, except that in the new form a cutting-off arrangement is provided. The advantage of this is at once apparent, as the use of separate pipe cutters can be dispensed with.

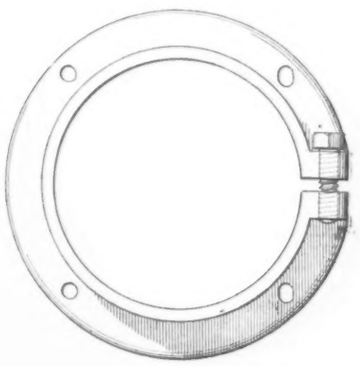


*Fig. 3.—Top View of Ring C (Fig. 1.)*

Our two larger engravings, Figs. 1 and 2, represent a vertical section and a top view, and show all the new features. The shell A, as in the ordinary form, has radial socket arms for the working levers. At the inner side of this shell is a cylindrical collar, C, which is split or longitudinally divided at one side, as shown more clearly in Fig. 3. This collar C has a flange which, by means of set screws, is attached to the adjacent side or surface of the shell A. The holes in those parts of the flange adjacent to the split are elongated, as seen in Fig. 3, and the collar is itself made elastic, so that on occasion it may spring outward loosely from the sleeve D (Fig. 1) upon which it is placed. The grip of the collar C is controlled by a bolt passing through its lugs. At its inner circumference the collar, moreover, is rabbeted, the sleeve D, having a corresponding flange which is arranged to fit so that its longitudinal withdrawal from the collar C is impossible. The sleeve D is threaded inside the pitch of the thread corresponding to that of the thread to be cut on the pipe. The thread S screws upon the

shell E, and the latter is provided with set screws *m* arranged radially.

To the front of the shell A is fitted a movable cover, F, pivoted at *n* and having an opening which, when the cover is in place, is coincident with the bore of the axle-shell E. The cover F is provided, also, with a slotted lug, *s*, which, when the cover is closed, straddles a set-screw, by which it may be held in place. An adjustable head, B′, sliding in guides A′ A′ on the cover F, carries a cutting tool for severing the pipe to be operated upon. The head B′ may be moved back and forth by turning a screw journaled in a bearing, E′ and working in the nut D′.

In order to use the apparatus for screw-cutting there is placed in the chamber B of the shell A a false bearing, G, the circumference of which should fit the internal circumference of this chamber, so that it may rotate with the rotation of the shell A. The opening of this false bearing corresponds in diameter to that of the pipe H to be cut. At the opposite end of the apparatus—that is to say, in the outer end of the axle-sleeve E—is inserted a second false bearing, J, which is provided with radial slots, through which may pass the screws *m*. The bore or orifice of this second false bearing, like that of the first, corresponds to the pipe H. When the pipe to be severed corresponds in diameter to the internal diameter of the axle-sleeve E, the second false bearing may be dispensed with.

When the apparatus is to be used for cutting pipe, the latter is thrust through the apparatus with the place at which it is to be cut or severed brought opposite the butter in the sliding head B. The split collar C is loosened, so that instead of binding upon the sleeve D it runs free, and the sleeve itself is screwed down to its limit upon the axle shell E, and the set-screws *m* are screwed in until their inner ends bind upon the pipe H to an extent sufficient to prevent the false bearing J, the axle-shell E, and the sleeve D from turning upon the pipe H. This causes the sleeve D to form a journal or bearing for the split collar C concentric with the pipe H. The cutter in the head B′ is then fed toward the pipe simultaneous with the rotation of the shell A and split collar C, around the pipe, this being continued until the operation of cutting is completed.

When the apparatus is to be used for screw-cutting, the false bearing G is replaced by a suitable screw-cutting die, a false bearing, J, in the sleeve E being used or not according as the diameter of the pipe H to be threaded is the same or less than that of the sleeve E. The latter is clamped to the pipe in the same manner as when the pipe H is to be severed. The split collar C is tightened upon the sleeve D, so that it will be governed by its movement. The cutter is moved away from the pipe, so that its rotation shall not affect the pipe. The shell A being then rotated, the screw-cutting die acts upon the exterior of the pipe to cut the thread, the requisite feed being given to the pipe by the action of the screw-thread S of the axle-sleeve E upon the thread of the sleeve D. The cover F serves the same purpose with regard to the screw-cutting die that it does with reference to the false bearing G—*i. e.*, that of keeping the part in place and retaining it in the proper position for use.

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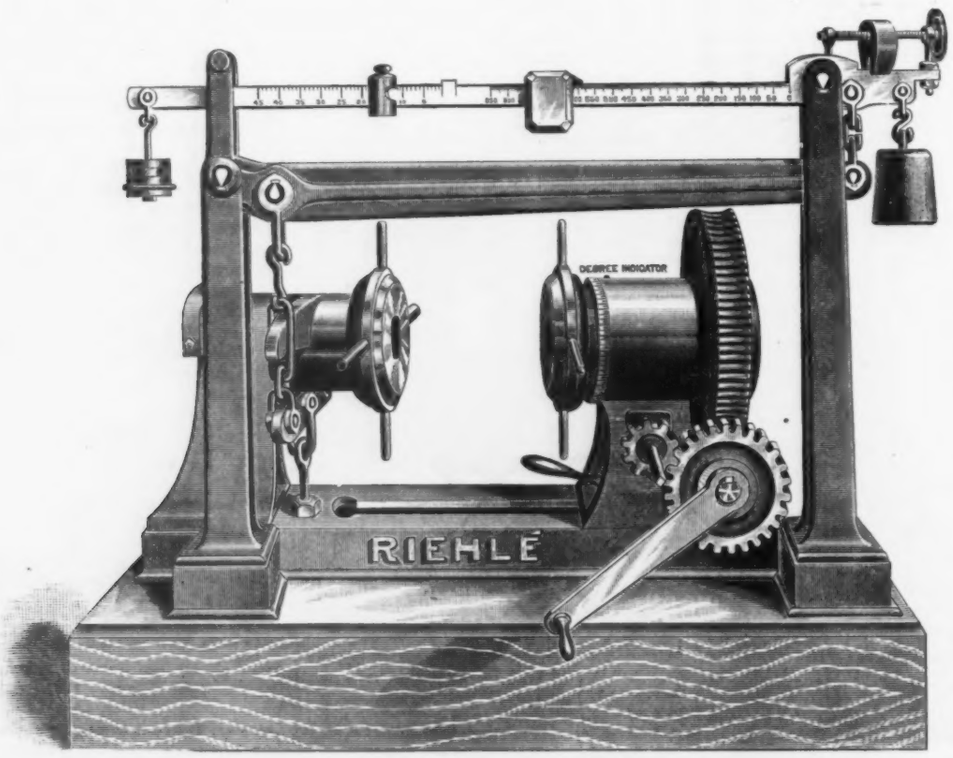
The manufacturers of cast-iron pipe will have an excellent demand for their products in Chicago this season. In addition to the natural growth of the city water supply, which will require a great deal of pipe, suburban improvements will be on as large a scale as ever. Holders of outlying land have found that building lots are more easily sold when the modern conveniences have been placed within reach, and they are, therefore, disposed to lay water, gas and sewer pipe at their own expense to induce purchases of their lots. The gas companies also contemplate extensive improvements, and the information comes from a reliable source that they will probably require 100,000 tons of pipe to carry out their plans. The local iron trade of Chicago will derive very little benefit from this large consumption of iron in their immediate locality, as Chicago has no cast-iron pipe works.

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## New Torsional Testing Machine.

Messrs. Riehlé Bros., of Philadelphia, Pa., have just put on the markct the newly designed torsional testing machine shown on this page.

It is constructed entirely of iron, brass and steel, and consists of one fixed and one adjustable head. The fixed head, carrying self-centering grips, has arms 1 foot in length projecting from either side of the grip-head (which is supported on a knife-edge). To prevent the grip-head from lifting from its position, the 1-foot arms are connected to an equalizing lever underneath, and this in turn connects with the weighing beam, where the strain is recorded in foot pounds without any calculation on the part of the operator. The movable head can be moved up to the fixed head to take in specimens a few inches in length, or moved away to take 20-inch specimens, or of any desired length. This head has self-centering grips and also has graduation marks to give the number of degrees the free end has been moved. The power is applied by hand at either of the two points on the larger wheel, giving greater speed and less power, or on the smaller wheel, giving decreased speed and greater power. A slight modification of this design enables belt-power to be applied instead of hand-power. The result of a test is at once apparent in foot pounds on the weighing beam, and the traverse of the moving end of the bar is recorded by the graduated head and indicating figure. The extreme hight of the machine is 3 feet 4 inches; length, 4 feet 9 inches, and width 24 inches.




NEW TORSIONAL TESTING MACHINE, BUILT BY MESSRS. RIEHLE BROS., PHILADELPHIA, PA.

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The steel required for the United States ship of war Maine aggregates about 2000 tons.

# THE WEEK.

The chief of the Order of Railway Conductors of America formally condemns the recent strike on the Burlington Road. "The order," he says, "do not countenance the strike, because they believe it wrong in principle. While they consider that every man has the right to leave the service of his employer at pleasure, they deny the right of any man to manage his employer's business for him. The Order of Railway Conductors are opposed to all combinations that have for their object compelling individuals to submit to proposed contracts which they have no voice in making."

Before the close of navigation this season, it is said, the foundation for one of the most colossal lightering stations and general warehouses in existence will be laid at the mouth of the Chicago River, on land controlled by the Illinois Central Railroad. The cost will approximate $2,000,000, which will be furnished by the railroad company to a Chicago-Buffalo syndicate that is to have the management of the enterprise.

Louisville is about to erect its first cotton mill.

Petroleum shipments from Philadelphia since January 1 amount to 38,400,000 gallons, a falling off of nearly 10,000,000, compared with last year. This heavy decline is attributed to the fact that the Russian oil is gaining entrance into many of the ports in the Mediterranean heretofore supplied from America.

The following will show how rapidly the commerce of the world is being changed from sailing vessels to those propelled by steam :

*Sailing Vessels.*

| | No. of Vessels. | Tonnage. |
|---|---|---|
| In the home trade | 9,626 | 646,679 |
| Partly home and partly foreign trade | 448 | 59,436 |
| In the foreign trade | 2,923 | 2,526,117 |
| Sailing vessels | 12,997 | 3,232,232 |

*Steamers.*

| | No. of Vessels. | Tonnage. |
|---|---|---|
| In home trade | 1,667 | 310,444 |
| Partly home and partly foreign | 235 | 110,091 |
| In the foreign trade | 3,018 | 3,491,330 |
| Steamers | 4,920 | 3,911,865 |

Of course the proportion of the trade by steamers is even greater than is shown by the relative tonnage, as their voyages occupy a much shorter time. In Germany the mercantile navy consists of 3327 sailing vessels of 830,789 tons, and 694 steamers of 453,914 tons. In France there are 14,100 sailing vessels of 492,807 tons (including many small craft) and 951 steamers of 500,484 tons, the aggregate tonnage of the latter exceeding that of the former.

Austrian Government agents have intercepted a lot of Hungarian peasants who started for America and arrested the steamship agents, otherwise the "abductors of military material."

Deaths from contact with electric wires multiply. A lineman of the Brush Electric Illuminating Company removed the insulation of a wire on Broadway, and, cutting into the copper, he must have touched the iron cornice, permitting the electric current to pass through his body.

Frank McCoppin, United States Commissioner to the Melbourne Exposition, has issued a circular stating that arrangements have been made with the Oceanic Steamship Company to forward all exhibits at a reduction of 50 per cent. from the ordinary rates, while a special rate for passage of $300 from San Francisco to Sydney and return, good for eight months, has been made. Mr. McCoppin's address will be 1726 Pennsylvania avenue, Washington, D. C., until May 20, and after that date, "care of the United States Consul-General, Melbourne, Australia."

The official liquidator of the American Exchange, in London, is of the opinion that creditors will receive no more than 10 cents on the dollar. There were letters of credit to the amount of about $50,000, but of these cash letters amount to only $15,000 divided among 40 holders.

E. S. Prosser, in past years conspicuous for his efforts to promote the interests of the State canals, died in Buffalo, 11th inst., aged 78 years.

Coal discoveries of value are announced to have been made in the Black Hills of Dakota. A correspondent writes to the St. Paul *Pioneer Press* as follows: "On the north, south and west of the Black Hills are hundreds of thousands of acres of coal in veins from 5 feet upward, some being the thickest in the world. The coal is a lignite, or brown coal, a soft variety, excellent for heating purposes. A vein on the south side measures 180 feet in thickness, while from 20 to 30 feet is of common occurrence. Several of the most important lines of railway are extending in that direction and entering claims, including the Burlington and Missouri River, and the Manitoba, Illinois Central and others will follow as soon as possible, all ambitious to share in the riches now stored in that vast solitude."

The inspectors employed by the Aqueduct Commission to examine contractors' work on the new tunnel are going through the masonry section by section, in one instance cutting more than 500 holes in a section for the detection of fraudulent work and providing the remedies. This examination has been in progress several months, and President Spencer is confident that in another fortnight all parts of the structure will be completed in accordance with the contracts.

The borax business of the West Coast is thrown into confusion by the recent failure of Wm. T. Coleman & Co.; other companies which were offshoots of the concern have been compelled to file their assignments. The lands deeded to them jointly comprise 10,000 acres in Inyo and San Bernardino counties, but are still a part of the assets of the original firm.

The Collector of Customs, at New York, has been instructed to refund the duties exacted on parts of machinery of certain dredges of domestic manufacture used in the construction of the Panama Canal, and imported at New York for repairs, and then re-exported to Panama. The machinery in question is held to be exempt from duty as manufactures of the United States exported and returned.

Mr. Edison claims to have perfected his phonograph, by which the human voice is repeated, and, by means of a wax impression on the "reproducer," wax copies or the original cylinder may be mailed anywhere, to be repeated from another phonograph. "We are now able," said Mr. Edison to a reporter, "to put a phonograph cylinder at the telephone and make it talk to some one in New York by wire." Mr. Edison's faith in the enterprise is shown by the building of a phonograph factory 600 feet long and 75 feet wide, at Orange, N. J., which will be finished in two weeks. A reporter describes the apparatus as follows: The "talking machine" of a dozen years ago has disappeared, but the principle remains and is now in the form of a practical commercial invention as well as a pleasing toy. There is a motor box about 11 inches square and the armature in it is only a horizontal ring or wheel of metal, with 10 pole pieces at regular intervals on the rim. The "cat-power" battery is in a separate case underneath. The phonograph is a separate arrangement, attached to the motor box by two screws. There is a small shaft 4 inches long, with 100 threads to the inch, which feeds what looks like a pair of spectacles with a receiver and transmitter in one ring. Then there is a recorder in the form of a steel knife fastened to the diaphragm. The receiver is a delicate metal needle, which operates on a phonograph blank of white wax. This blank is hollow and tapers inside so as to bind by friction in hot or cold weather on a metal drum. A second shaft has a coarse reverse thread and is only used where repetition is desired. On the surface of the little wax blank, which looks like an ivory dice-box, can be recorded from 1000 to 1200 words or several musical compositions. A wax blank can be automatically pared from 15 to 20 times for new records. When in motion the phonograph looks very much like a turning lathe.

Consul Neuer, at Gera, writes to the Department of State that Germany affords a market for gas stoves, giving promise of an extensive business. He says: "If proper steps are taken our manufacturers will find a ready sale, as I know by experience that they are far superior to any others." Consul Man, at Stockholm, calls attention to the fact that the Swedish Diet has imposed a tariff duty of about 3 cents per pound on smoked bacon and hams and 2½ cents per pound upon all other pork. He thinks the effect of the duty will be to prohibit the importation which at that port alone has averaged about 3000 tons per annum.

Mayor Hewitt has made the following appointments: Gen. Fitz John Porter, Fire Commissioner; Charles F. McLean, Police Commissioner; Stephenson Towle, Park Commissioner; James Daly, Commissioner of Accounts.

The Supreme Court in New Orleans has decided in favor of the tower system of suspending telegraph and electric-light or other wires in the public streets, and lamp-posts will be abolished.

The Gloucester fishermen expect to settle the bait question by introducing a German process of preserving herring and other small fish used for bait in a steel barrel containing an antiseptic solution as a substitute for ice, which is far more expensive.

The Chignecto Ship Railway is the latest Canadian scheme for which the Government proposes to borrow money. According to the Montreal *Herald* "about $3,500,000 of Canadian money is to be put on a hook as bait to catch a larger sum from credulous British investors." So far as can be ascertained, there is no commercial necessity for the railway, no demand for it outside of the projectors, and no chance of its ever paying a dividend.

The sand is being pumped out from the shore shaft of the new water-works tunnel at Cleveland, Ohio. When a hole 80 feet deep has been made the workmen will descend and begin excavations.

The Philadelphia Natural Gas Company, of Pittsburgh, paid during the year just ended 1 per cent. monthly on its capital stock of $7,500,000. Among their 23,707 customers are 678 manufacturers.

The Master Builders' Exchange, in Philadelphia, have determined to establish a mechanical trade school in which practical instruction shall be given in plumbing, bricklaying, carpentry, stone cutting, blacksmithing, painting, plastering and such other trades as necessity may call for The offer of Col. Richard T. Auchmuty, the founder of the New York trade schools, to

give $3000 annually for three years toward the support of the proposed school was accepted. Resolutions were adopted setting forth that, as the apprenticeship system, especially in all large cities, is practically obsolete, the establishment of trade schools is the only method of securing American journeymen.

The New York State Legislature adjourned on Friday and will not come together again unless Governor Hill sees the necessity of an increased appropriation for the manufacture of goods in the State prisons, the bill appropriating $1,000,000 for this purpose having failed to pass. The anti-trust bill failed in the Assembly, but the Vedder bill, taxing foreign corporations ⅛ of 1 per cent. on the capital stock, was passed. Dr. Smith remains Health Officer of the port, but his emoluments are cut down to $10,000. The Aqueduct Commission remains without the addition of the Mayor and Comptroller. The New York and New Jersey bridge bill failed to receive the two-thirds vote necessary to suspend the rules and pass it in the Senate. The Senate Finance Committee reported that the assessed valuation of the State is $3,470,513,165, an increase of about $110,000,000 over last year.

The statistics of new shipping furnished by the Bureau of Navigation afford a very favorable showing for the present season, and those for the month of April, covering the period of greatest activity in the lake region, are particularly significant. The following is a comparison for April, 1887 and 1888, of the sailing and steam vessels to which official numbers were granted by the Bureau of Navigation:

| | April, 1887 | | | |
|---|---|---|---|---|
| | Sailing | | Steam | |
| | No. | Tons. | No. | Tons. |
| New England..... | 9 | 1,467 | .. | .... |
| Middle, Atlantic and Gulf ..... .... | 19 | 477 | 11 | 2,122 |
| Pacific..... | 4 | 1,092 | 6 | 549 |
| Northern Lakes.... | 2 | 26 | 8 | 5,348 |
| Western Rivers.... | .. | .... | 5 | 347 |
| Total... ..... | 34 | 3,062 | 30 | 8,366 |

| | April, 1888 | | | |
|---|---|---|---|---|
| | Sailing | | Steam | |
| | No. | Tons. | No. | Tons. |
| New England..... | 11 | 2,813 | 4 | 151 |
| Middle, Atlantic and Gulf.... ..... | 19 | 295 | 12 | 1,813 |
| Pacific..... | 6 | 1,042 | 14 | 2,427 |
| Northern Lakes.... | 5 | 4,333 | 24 | 18,301 |
| Western Rivers ... | .. | .... | 4 | 689 |
| Total.... ..... | 41 | 8,482 | 58 | 23,381 |

In response to the urgent recommendations of the Madrid Chamber of Commerce, there is a probability that the Spanish Government will soon provide for the establishment of a line of steamships to the United States.

The members of the Western Paper Manufacturers' Association have signed an agreement by which a board of five trustees shall have power to order the mills to shut down for a period of not more than two weeks at a time and not more than three months in the year. G. P. Brown, of Fort Madison, Iowa, secretary of the association, said: "There is not a mill west of the Alleghenies that is making money; paper is selling at just about what it costs, and something must be done."

According to the assessors' footings the total assessed valuation of real estate in Buffalo is $133,247,125, an increase over 1887 of $4,615,830. The rate of taxation is $14.3445.

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The Cleveland Frog and Crossing Company have been incorporated at Cleveland, Ohio, with a capital stock of $100,000. The following are the incorporators: N. P. Bowler, William Bowler, Washington W. Balkwell, George C. Lucas and William L. Bowler.

# MANUFACTURING.

### Iron and Steel.

The wages of the laborers in the employ of the Sharon Steel Casting Company, at Sharon, Pa., have been reduced to $1.25 per day. The few who stopped work on account of the reduction did not in any way interfere with the running of the works.

On Monday, the 7th inst., notice was posted by the superintendent of the Bellefonte Iron and Nail Company, of Bellefonte, Pa., that all men reporting for work at once under the terms proposed would be considered employees; the others might consider themselves discharged. Not a man reported, all maintaining that the demand for 25 cents per day was just. On the other side, the company are just as firm in their determination not to yield, and, as they have orders that must be filled, will proceed to fill the strikers' places with new men. The strike has thrown about 200 men idle.

Chess, Cook & Co., the well-known nail manufacturers of Pittsburgh, have gone into the manufacture of a patent fence, made from steel plates. The inventor of the new fence is John Golding, of Chicago, and the above firm have purchased the right for its manufacture in the States of Pennsylvania, New York, New Jersey, Ohio, Delaware and West Virginia. They have already contracted for the machines, the first of which was received on Monday, the 7th inst. They expect to be running them in the course of three or four weeks. The process of the manufacture of the fence is as follows: A small piece of soft steel plate is placed in the machine. The steel is cut diagonally in small strips, the operation being repeated until the entire plate is cut into small layers, which are double jointed at short intervals. As the work progresses these layers are gradually drawn apart until the steel plate is several times its original size, with the result that a piece of fencing 8 feet long and any desired hight is produced.

All efforts to settle the long standing strike at the blast furnace of the Charlotte Furnace Company, Limited, at Scottdale, Pa., mention of which has been made in these columns before, have been unsuccessful. The firm still insist that the men must accept the 12½ per cent. reduction and will not recede from the stand they have taken. The men offered to accept 8 per cent., but the firm would not listen to it. The furnace has been banked since January 1. About 100 men are out.

The report that the works of the National Tube Works Company, of McKeesport, Pa., would close down on the 1st prox., for an indefinite period, is without foundation. A representative of the company states that, while orders are a little dull, and some furnaces may be laid off for a short time during the hot weather, it is not likely that a mill doing a $10,000,000 business annually will be closed down entirely.

The extension to the plant and additions to the straightening department of the works of the Columbia Iron and Steel Company, at Uniontown, Pa., are about completed, and arrangements are being made to put the plant on double turn at an early date. The firm have a large number of orders on hand, which will necessitate running the plant to its utmost capacity.

The March report of Fayette Brown, receiver for Brown, Bonnell & Co., at Youngstown, Ohio, which was filed in the clerk's office of the United States Court, on Thursday, the 10th inst., contains the following statement: Cash on hand March 1, $21,743.11; receipts during the month, $218,993.71; disbursements, $236,112.09; on hand March 31, $4,624.73.

Fifteen carloads of heavy machinery for the new steel forging works of the Bethlehem Iron Company, at Bethlehem, Pa., which arrived at Perth Amboy from England, were taken to Bethlehem over the Lehigh Valley Railroad recently. This is the second consignment received from abroad for this new branch of the company's business.

A press dispatch from Phillipsburg, N. J., under date of the 10th, says: The Delaware Rolling Mill, at this place, has been shut down for an indefinite period for want of orders, and nearly all of its employees have left town not to return. Puddlers at the rolling mill at Highbridge have struck against a reduction of 75 cents per ton in wages.

The new firm of Benjamin Atha & Co. has been incorporated in Newark, with a capital of $750,000, in 7500 shares, of which Mr. Atha holds 7100. The other incorporators are: John H. and Robert F. Ballantine, brewers; William Clark, thread manufacturer, and George H. Hughes, one of Mr. Atha's partners in the enameled cloth business, which Mr. Atha's father established before the Atha Steel Works were thought of. In connection with the new steel company, the Atha Tool Company were incorporated, with a capital of $100,000, Mr. Atha retaining 960 shares. The new company will operate the works on the Passaic, as well as the newly acquired plant in Jersey City, and Mr. John Illingworth, who was bought out by his partner, Mr. Atha, will start at once to build a new steel works, with a capital equal to that of the Atha company.

Articles of association have been filed by the Muncie Forge and Iron Company, Muncie, Ind., with a paid up capital stock of $50,000, the stockholders being well represented in the directory by Messrs. John H. Carter, Lewis K. Torbett, Albert R. Corre and Charles T. Dickson, all prominent capitalists of Cincinnati.

Muirkirk Furnace (charcoal) of Charles E. Coffin, at Muirkirk, Md., which has been idle since November of last year, was blown in again on Monday, the 14th inst. During the period of idleness it has been thoroughly repaired and relined.

Only two blast furnaces in the Mahoning Valley, Ohio, are reported out of blast at the present time—viz., the Himrod, at Youngstown, and the Thomas, at Niles.

The nail factory of the Belfont Iron Works Company, at Ironton, Ohio, is in full operation, 126 nail machines being employed.

Marble Furnace No. 1, of Perkins & Co., Limited, at Sharpsville, Pa., was blown out on the 1st inst. for the purpose of being relined and repaired. It has had a very successful blast and will blow in again when repairs are completed.

At a meeting of the Henderson Steel and Mfg. Company, held at Birmingham, Ala., on April 28, for the purpose of deciding the question of increasing the capital stock, Messrs. J. S. Howell, J. W. Bush, C. G. Brown, Gaylord B. Clark, of Mobile; the president, H. T. Groom, of Lexington, Ky., and the secretary, H. F. Wilson, with Col. J. A. Montgomery as chairman, were appointed a committee to formulate plans for so increasing the capital stock and the details of the new plant, and were instructed to report at the next meeting, which will be held on May 18th. It was decided to increase the capital stock to $1,000,000 and erect as soon as possible a large plant for steel making.

In the meantime the present plant will be kept in active operation. The company, it is stated, will locate their new plant wherever the best inducements are offered.

McClure & Shuler, engineers and contractors at Pittsburgh, have received contract for relining Isabella Furnace No. 1, at Etna, Pa. The same firm are also relining Rebecca Furnace, of the Kittanning Iron Company, Limited, at Kittanning, Pa.

The Straight Fiber Iron Company, 407 Rookery Building, Chicago, have completed their new rolling mill at Fortieth street and Stewart avenue, and started up some of the machinery last week for a trial run. This week they expect to get fairly started in the production of their straight fiber iron for car axles and special bar iron for railroad use.

The Bethlehem Iron Company, last Thursday, made a very large casting, being the base for the large steel compressor to be used in the new gun steel works. One hundred and twenty-four tons of molten metal were poured into the mold.

The extensive stables attached to the ironworks of R. D. Wood & Co., at Cooper's Point, N. J., were burnt on Saturday, as supposed, by an incendiary. Loss $12,000.

Pequest Furnace, owned by Messrs. Cooper & Hewitt, situated near Oxford, Warren County, N. J., will go out of blast during the latter part of May, owing to the continued depression in the iron business. The furnace is under the management of Mr. John S. Fackenthal, and has been in successful operation during the past two years, the product for one calendar year having reached 24,865 gross tons.

### Machinery.

The foundry of North Brothers, Twenty-third and Race streets, Philadelphia, was destroyed by fire during the week, the loss being estimated at $20,000, covered by insurance.

Shearer & Hicks, machinists and boiler makers, at Bradford, Pa., who are contemplating the removal of their works to Butler, Pa., under date of the 4th inst., write us as follows: "The certainty of the movement of our works to Butler is not yet assured, but if satisfactory arrangements can be made we will probably move the entire concern to Butler, building a foundry, tool shop, boiler shop, and in short just doubling our present capacity."

Contracts for furnishing machine tools for the Norfolk Navy Yard have been awarded as follows: Niles Tool Works, of Hamilton, Ohio, $20,800; Wm. Sellers & Co., of Philadelphia, $11,391; Morgan Engineering Company, of Alliance, Ohio, $4560; Bement, Miles & Co., of Philadelphia, $8375; Manning Maxwell & Moore, New York, $2450.

The Rhodesburg Mfg. Company, of Philadelphia, who excelled in making textile manufacturing machinery, have gone into the hands of a receiver. The most pressing creditors are the Crane Iron Company.

What is claimed to be the largest spur gear ever made in the United States was cast in the works of the Walker Mfg. Company, of Cleveland, Ohio, on Tuesday, the 6th inst. The weight is 50,000 pounds. The gear is machine molded, and is the main driving-wheel for the St. Louis Cable Railway Company's new plant in St. Louis. The Walker Mfg. Company have the contracts for buildings, engines and all machinery for that company, and expect to have the road running by June 5.

On Wednesday, the 9th inst., the following notice was posted in the machine shops of the Philadelphia and Reading Railroad Company, at Reading, Pa.: "CIRCULAR No. 13.—READING, May 9.—On and after date all overtime must be discontinued in car and locomotive repairs. If an emergency requires, time and half-time will not be allowed for such work under any circumstances. G. W. CUSHING, superintendent of motive power and rolling equipment."

The Ingersoll Rock Drill Company, of New York, have shipped to the International Exhibition, Barcelona, Spain, a line of mining machinery, with catalogues and circulars printed in English, French and Spanish languages. The exhibition opens early in May, and will continue about six months.

We are in receipt of a copy of a new 16-page catalogue of steel pressure blowers, built by B. F. Sturtevant, of Boston, Mass , which illustrates these well-known machines with all their latest improvements. Mr. Sturtevant's catalogues have always been celebrated for their valuable tables relating to the properties of air in motion, and in this one are to be found a number which render the catalogue of great utility to foundrymen, blacksmiths and iron workers of all classes. The catalogue is known as No. 33.

The Smith-Hill Foundry and Machine Company were organized recently at Quincy, Ill. This corporation, with a capital of $75,000, succeeds to the business of Smith, Hill & Co. The officers of the company are Ceylon Smith, president; Thomas Hill, vice-president and superintendent; C. G. Comstock, secretary and treasurer.

The Erie City Iron Works, of Erie, Pa., have just issued a new catalogue describing their automatic engine. It is an attractive pamphlet, measuring 5¼ by 9 inches and embracing 16 pages.

Messrs. P. Blaisdell & Co., of Worcester, Mass., have issued a new catalogue of machinists' tools, illustrated throughout and attractively arranged in every respect. It embraces 24 pages.

Riehlé Bros., proprietors of the Philadelphia Scale and Testing Machine Works, Ninth and Master streets, Philadelphia, report the following recent orders: Two 30-ton platform scales for weighing heavy boilers, for Wm. Cramp & Sons; 4 30-ton platform scales, for Phœnix Iron Company; 1 12,000-pound heavy rolling mill scale, for Catasauqua Mfg. Company; 1 6000-pound do. and 1 5000-pound foundry testing machine, for Houston Car-Wheel Company, Houston, Tex.; 1 furnace charging scale, for the Warren Furnace Company, Hackettstown, N. J.; 2 furnace charging scales, for the Thomas Iron Company, Hellertown, Pa.; wagon scales, for Mahlon, Fulton & Co., John Davenport, of Philadelphia, and R. Hecksher & Sons, Swedeland, Pa.; 1 wagon scale and 1 railroad track scale, for the Lebanon Rolling Mills, Lebanon, Pa.; 1 miner's scale, for the Repauno Chemical Company, Chester, Pa.; 1 4-ton miner's scale, for the Buffalo Creek Coal Company; 2 wheelbarrow scales, for the Lehigh Valley Railroad, Perth Amboy; 1 8000-pound rolling mill scale, for Wm. Cramp & Sons; 1 binder twine testing machine, for Jno. T. Bailey & Co., Philadelphia; 1 cloth testing machine, for Greenwoods Company, New Hartford, Conn.; 1 5000-pound foundry testing machine, for the Edison Machine Works, Schenectady, N. Y.; 1 rope twister, for the South Pittsburgh Pipe Works, South Pittsburgh, Tenn.; 1 10,000-pound and 1 20,000-pound compound parallel crane beam, for Frick Company, Waynesboro', Pa.; 1 10,000-pound compound parallel crane beam, for Samuel G. Moore, Sons & Co., Elizabeth, N. J.; 1 sand sifter, for Croft & Allen, Philadelphia; 1 improved marble molding and countersinking machine, for Brunner & Schlichter, Cleveland, Ohio; 1 do., for Robert Fisher, New York, and another for Batterson, Lee & Isler, New York.

The nail factory of the Bellaire Nail Works at Bellaire, Ohio, which has been idle for the last few weeks, has resumed operations again.

The works of the Stewart Iron Company, Limited, at Sharon, Pa., are running nearly to their full capacity. Both blast furnaces of the company are in operation, and 13 of the 15 puddling furnaces in the rolling mill department are also running. The Bessemer iron, which is the product of the works, is being stacked mostly, but comparatively little being shipped. About 175 persons are now employed at this industry.

A dispatch from Hollidaysburg, Pa., under date of the 13th inst., reads as follows: The strike at the rolling mills of the Portage Iron Company, McLanahan, Smith & Co., and the Hollidaysburg Iron Company terminated on Saturday in a victory for the employers. Seven hundred men have been idle six weeks because the puddlers wanted $4 a ton and the companies offered but $3.75. The latter called a meeting of their men on Saturday and renewed the offer of $3.75, which was accepted by some of the puddlers, and the mills will be started up this week. Those who do not report for work will be discharged and their places filled by men brought from a distance.

The Pittsburgh Steel Casting Company, of Pittsburgh, recently shipped one carload of Hall's patent roller shells to Australia, and are making another carload for shipment to Utah, making in all five carloads of these shells which they have furnished.

Sharpsville Furnace of the Sharpsville Furnace Company, at Sharpsville, Pa., which has been idle for some time undergoing repairs, has resumed operations, with good prospects for a steady run.

### Hardware.

Jetter Mfg. Company, Buffalo, N. Y., succeeded in March last to the business of Gates & Jetter, and will continue the manufacture of files, screw drivers, reamers, nail sets, fire pokers, cold chisels, wrought goods, &c., as well as the combination hatchet and hammer and other hardware specialties. They are preparing also to make shoe and kitchen knives.

The Portchester Bolt and Nut Company, Portchester, N. Y., are building an addition to their factory and increasing their power in order to enable them to meet the demand which is pushing them in all departments.

Studebaker Bros., South Bend, Ind., have established a branch of their factory at Paoli, Ind., for manufacturing wagon woodwork.

A reduction in wages has been made in several of the leading axle works on account of the fact that there is an overproduction of axles, and stocks have accumulated beyond the demands of trade.

It is reported that the Canton Hoe and Tool Company, Canton, Ohio, have made an assignment, the liabilities being estimated at about $25,000.

The Andrus Mfg. Company, Rochester, N. Y., were organized February 6, 1888. Their officers are as follows: Byron H. Rose, president; F. L. Rosenstreter, vice-president; Charles A. Clark, treasurer, and Fred. M. Andrus, secretary.

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The Cleveland, Ohio, freight committee have reduced rates on pig iron from Cleveland to the Mahoning Valley and some other interior points, to take effect immediately, and reductions to Chicago and other common points will be made soon.

# The Iron Age

New York, Thursday, May 17, 1888.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.


The sensation of the week was the announcement made on Tuesday of a reduction in the price of pig iron by the Thomas Iron Company of $2 a ton, making the prices for No. 1 foundry, No. 2 foundry and gray forge respectively, at tidewater, $18, $17 and $16—virtually a cut of $1 a ton under the figures at which standard brands of foundry irons were selling in some markets. Mr. B. G. Clarke, president of the Thomas Iron Company, has repeatedly adopted such heroic measures in the past, when active competitors showed too much eagerness in capturing trade which he considered peculiarly his own. As we have stated again and again in our market reports during the past months, Southern and Western irons were being offered at lower and lower prices. The step taken by Mr. Clark is an evident effort to reach bottom at once, with the object of heading off iron from other quarters. Whether or not the remedy is radical enough will soon develop. It will certainly tend to a general adjustment of the terms of contracts in force east of the Allegheny Mountains and north of the Potomac. It will cause the blowing out of a number of Northern furnaces and will force a larger proportion of Western and Southern irons into markets west of the Allegheny Mountains and north of the Ohio. At least one leading Virginia company has announced its determination to meet the cut and others may follow.

The Edgar Thomson Steel Works have been singled out by W. L. Scott, of Erie, Pa., to illustrate the iniquitous manner in which the steel rail interest is fleecing the consumer. Mr. Scott has shown some ingenuity in collecting figures, he having secured, among others, a copy of a schedule of wages paid in 1887 at the mill named, and has undertaken to compile therefrom a statement of the cost of making rails at Braddock. His figures are worth reproducing:

*Cost of Making Steel Rails.*

| | |
|---|---|
| Market price of 1 ton No. 1 Bessemer pig at Mill | $18.00 |
| Converting same, per ton | 1.50 |
| Blooming | 0.72 |
| Finishing | 1.87 |
| 1.2 tons Connellsville coke @ 1.35 | 1.62 |
| Total | $23.71 |
| Add net loss on material first to last, 13 per cent. | 3.08 |
| Total | $26.79 |

Those who have pondered over the details of figuring out the cost of manufacture will be surprised at Mr. Scott's easy methods. The perplexing questions of crediting scrap, &c., disappear. We find no items for refractories, spiegel, oil, waste, repairs, fuel for steam, reheating, or occasional pig melting, but are at a loss to account for the coke, which in the quantity given must have strayed into the calculation by accident, since the Edgar Thomson Works are supposed to use the direct process during the greater part of the time. But Mr. Scott's eccentricities of cost calculation pale into insignificance as compared with his statement that since the labor cost is $4.09, arrived at by adding the figures on converting, blooming and finishing, the percentage of labor cost to the cost of production is 15.26 per cent. He argues that even if an allowance is made of 50 per cent. in labor between England and the United States, equal to $2, and if the difference in the cost of pig is between $18 and $12.50, then $7.50 "would cover every claim upon which the theory of protection is based."

## The Mills Metal Schedule and the Revenue.

When the details of the Mills bill first became known to the iron trade the objection was at once raised that instead of reducing the revenue the effect would be to increase the total duties collected. It may be conceded that it is a very difficult matter to forecast the influence upon importations of a lowering of the tariff, since it depends upon a great variety of circumstances and demands a comprehensive knowledge of facts, which few experts, if any, possess. To judge of its effect it would be necessary to ascertain to what extent American manufacturers could reduce cost by demanding a lowering of wages, a reduction in freights, in supplies, in royalties on mineral property and on patents, in the interest rate on mortgages and bonds, &c. The shrinkage in profits would have to be borne, not alone by the manufacturer and his workmen, but by middlemen and retailers also. How much in the aggregate such reductions in the cost of placing the finished article in the hands of the consumer are it would be very difficult to estimate. Yet it would be one of the factors to determine the quantity imported, and hence the aggregate duty collected. It would aid to solve the question whether our own manufacturers could not alone hold their own, but whether they would control the natural increase in the consumption, which is so great a factor in our country. To make any estimate of duty collected under a new tariff, we would have to know the cost to the foreign producer, and the capacity of foreign works, as affecting the question whether the opening of our market wholly or partially would tax their resources so much as to cause an advance in prices partly or wholly compensating for lowering the tariff. It would be necessary to be able to determine whether the duty on one particular article happened to be relatively the lowest among a group forming the series from the raw material to the finished product, so that it would involve a study of one rate with reference to others. Importers will quickly find the article of least resistance and an unexpectedly large quantity of the particular goods may be brought in. Let it be supposed that the duty on pig and ore is comparatively high and that the same is true of steel rails or other finished forms, while blooms or billets have relatively the lowest duty. In such a case the imports on all the articles named might decline, in spite of lower duties, while the quantities of blooms and billets might enormously increase.

We have thrown out these suggestions merely to indicate some of the many influences which might affect the quantities of articles imported under new duties, aside from those fluctuations in the demand and in prices here and abroad, which affect the volume of trade from month to month. It will be readily appreciated that therefore an estimate of the amounts of duties flowing into the treasury is a very complex problem, in which there can be a wide diversity of opinion, except in those cases where an article is placed on the free list, or where a prohibitory rate is substituted for a lower duty.

It was with considerable interest, therefore, that we looked forward to the details upon which the framers of the Mills bill based their estimates of the reduction in the revenue growing out of the proposed rates of duty in the metal schedule. The total was made $8,808,746.95, against duties of $9,937,574.48 during the fiscal year 1887. We are amazed to find that the former aggregate is a total compiled by assuming that the same amounts as were imported in 1887 should form the basis of the new duties collected—in other words, the economists of the majority of the Ways and Means Committee brush aside all considerations of the influence of a difference of duties in the volume of imports and estimate the revenue by multiplying the quantities imported in 1887 with the proposed rate of duty. To illustrate: In 1887 we imported 49,509 tons of steel rails at $17 a ton duty, making the revenue $841,667.63. The new rate is $11, hence they estimate the amount of duty at 49,509 x 11, equal to $544,608.49. Or taking another case, that of cutlery. The imports in 1887 were $1,419,861.27, on which the duty levied was 50 per cent., or $709,930.64. The proposed rate is 35 per cent., hence, according to the Committee, the revenue under its proposed tariff will be 35 per cent. of $1,419,861.27 or $496,951.44, a reduction of over $200,000. The same brilliantly simple method is followed throughout. It is to men of such caliber that the future of enormous interests, the welfare of hundreds of thousands of men is intrusted—men who are either unable to understand, or too indolent to ascertain the fact that a sharp reduction in the duties on an article imported on a large scale at the higher rate of duty will certainly not yield a revenue reduced in the exact proportion of the lowering of the rate, but that the reduction of the revenue will be at a much lesser rate, and that it is within the bounds of possibilities that the aggregate amount of money collected at the Custom House may be actually greater than the sum obtained on a smaller quantity of imported goods at a higher rate of duty. Leaving out of consideration the reduction of the revenue growing out of placing tin plates on the free list, we feel confident after an examination of the metal schedule that the total duties which would flow into the treasury if the Mills bill were to be enacted in anything like its present form would be considerably greater than the average sum collected since the time when the present tariff act went into force.

## Cut Nail Schedules.

The nail trade throughout the country is being agitated by the changes proposed in the schedules of extras, the subject having given rise to considerable discussion among the makers. The Western Association some time since adopted a new schedule, which is to go into effect in a few weeks, while the Eastern Association has under advisement a radically different scheme. To those not familiar with the trade the questions at issue may appear trifling. In reality their solution in the fairest and safest manner means the advent of a prosperous future to the majority of makers. During the past few years nail manufacturing has enjoyed the unenviable distinction of being in the worst condition among all the suffering branches of the iron and steel industry. Prices have persistently kept at a level which precluded all chances of a profit, except to a few mills possessing exceptional facilities. Again and again efforts were made to lift values by agreements among manufacturers, with only temporary effect. The only chance for profit or for recouping the losses on larger sizes lay in the margin in the finer nails called for. On a fair specification the extras represent an average of 30 to 40 cents a keg, and occasionally go considerably above these figures. So long as the schedule of extras was generally adhered to some chance of profit still remained. It was possible, by making a temptingly low price on base sizes, to secure from the buyer, in the way of full extras, more than an equivalent for the apparently liberal concessions made. It is probable that the sudden invasion of the wire nail gave the first impulse toward the demoralization in the most profitable reserve of the cut nail maker.

The two great divisions of the trade attacked the problem in a strikingly different manner. The Western Association reduced the extras on the finer sizes and on finishing and barrel nails, but added a new extra to 8d. and 9d., 10d., 12d. and 16d. Innocent as the latter move may appear, it really meant taking more with one hand than was given with the other. The course adopted has been the source of a good deal of dissatisfaction, and has not even met with the approval, although it secured the assent, of some of the largest Western makers. Those opposed to the change urge that producers who were unable or unwilling to maintain, even for a short period, small advances in the card rate, which certainly did not hold out the temptation of inordinate profits, cannot be expected to be bound for any length of time to a schedule which improves their returns from 10 to 20 cents a keg, according to circumstances. It is argued that they will either cut the extras or give apparent inducements to the buyer by naming an exceptionally low base price.

In the East the happenings of the past months have pointed to another course. Some of the smaller mills, knowing well that what chance of profit there was lay in securing orders for extra sizes, have educated buyers to the point of dividing up their specifications. They have attempted to secure from the larger mills as heavy a proportion of ordinary sizes as they could get and have then placed the cream of the order with the smaller mills who were willing to cut the schedule of extras heavily. Developments have therefore led Eastern manufacturers to face the question in quite a different manner. Practically base prices have been sold at loss or relatively a much lower profit than extra sizes, so that there has been discrimination against the former. By cutting down the schedule of extras the twofold result is to be secured of heading off the competition alluded to and of removing a fruitful source of demoralization. If the propositions now being discussed are carried through more stability will be given to base sizes, since quotations in them will not be so frequently made with the direct object to disguise cuts on the extras, nor will the temptation for the latter be so great. Such an adjustment of prices on the different sizes would lead also to a more harmonious approach to variations in cost, which, after all, is the only sound basis upon which prices can rest for any length of time. It is here that the difficulty of striking the correct differences in price in reality appears, because there must be added to it the expense of carrying stocks, which is far heavier in the case of sizes which are sold at long intervals and in small quantities.

## Wheat Crop Prospects.

The wheat markets on this side have been excited since April 1, when June delivery was bringing 88⅝ cents on the New York Produce Exchange, against 91¾ cents in 1887; on May 1 last the price was 93¼ cents for the same delivery, and on May 12 June had risen to 98 cents. December delivery stood 90⅝ cents on April, against 94 cents April 1, 1887; 94⅞ cents on May 1 last, and $1.00⅛ on May 12. The advance was based on the poor outlook for winter wheat in the Northwest, and in Ohio, Indiana, Illinois and Michigan in particular, which have produced 41 per cent. of the winter wheat in the United States during the last five years, representing 45 per cent. last year or 132,000,000 bushels of the 293,000,000 bushels of winter grain. Nor are crop advices from California of an encouraging kind. On May 4 it was estimated that the yield in that State would only be about 50 per cent. of what it was last year when the surplus reached 500,000 tons, the crop being looked upon as the poorest in 15 years.

On May 10 the Department of Agriculture at Washington, made its report, showing a reduction since last month of the general average of winter wheat from 82 to 73. This would indicate that the coming crop will fall about one-quarter below a full yield. The present estimate is about 12 points under that of May, 1887. This decline in the condition of winter wheat is attributed by the department to "low temperature and deficient rainfall, with drying winds and some frost in the Central States, while on the Pacific Coast only a medium development is reported." The shortage has been variously estimated at between 50,000,000 and 80,000,000 bushels.

The season is, however, now deleloping rapidly in the great wheat-growing States, and the change for the better has not come too late to help the crop, so that the deficiency may not, after all, be quite as great as the reports so far received would indicate. On May 11 it was thought that with favorable weather the winter wheat crop would yield 235,000,000 bushels as against 293,000,000 in 1887, 302,000,000 in 1886 and 212,000,000 in 1885, the average of six years, 1882 to 1887, being 305,000,000. In 1885 the world's wheat crop was 1,926,860,100 bushels, being 152,400,000 below the average, which was 2,079,260,700 bushels. People interested in grain on the other side have not followed suit very readily, as they look upon the advance here as being a "crop scare," and exporters here have been idle. On May 9 the grain on passage to Europe was 21,000,000 bushels wheat and 3,904,000 bushels Indian corn, being 1,136,000 bushels wheat and 568,000 bushels Indian corn in excess of the previous week. When compared with the corresponding date of last year the excess was 1,584,000 bushels wheat and 1,376,000 bushels Indian corn. The amount of wheat and flour now in transit to Europe, with the visible supply of wheat in the United States and Canada, is equivalent to 52,317,380 bushels of wheat, against 65,719,674 bushels one year ago, and of corn 13,340,671 bushels, against 18,141,986. The samples from the new crop of British India wheat received in Liverpool are said to be of satisfactory quality, denoting a good yield. From January 1 to April exportation had been as follows in hectolitres:

| | To England. | To the Continent. | Total. |
|---|---|---|---|
| From Bombay... | 252,300 | 849,700 | 1,102,000 |
| " Kurrachee. | 46,400 | ..... | 46,400 |
| " Calcutta... | 81,200 | 8,700 | 89,900 |
| Totals..... | 379,900 | 858,400 | 1,238,300 |
| Against 1887.. | 887,400 | 1,214,100 | 2,101,500 |

Reduced to metrical cwts. of 100 kg., Indian wheat exports have been from April 1 to March 31:

| | | | |
|---|---|---|---|
| 1887–88..... | 7,000,000 | 1884–85..... | 7,915,877 |
| 1886–87..... | 11,131,660 | 1883–84..... | 10,478,247 |
| 1885–86..... | 10,530,259 | 1882–83..... | 7,072,203 |

The present wheat crop in India has been an average one; it will depend on prices in Europe whether the larger amounts noted above will be reached or not.

Crops have also been good in Australia and New Zealand. Late advices report the wheat markets out there firm, but not very active, as present values in Europe offer but little inducement to shippers, and for the time of the year the number of ships loading is unusually small, taking into account the quality of the wheat available for export.

As soon as the navigation of the St. Lawrence opens, unusually large shipments will go forward from Manitoba to England.

It is too early in the season to speak of European wheat crop prospects. Should the weather favor the growth of the spring wheat on this side, and at the same time cause the yield of the winter wheat to turn out better than the present estimates, a reaction may set in against the apparently too rapid advance that has marked on this side the last few weeks. A remarkable feature of late years has been the increase in the amount of flour exported from the United States, the bulk of it going to England. Thus during the calendar year 1887, the total export was 12,181,310 barrels as compared with 9,851,536 in 1886, an increase of 2,329,774 barrels or 23 per cent., while wheat exports only increased

from 89,204,887 bushels to 95,128,641 or about 6 per cent. Since the beginning of the year flour export has fallen off somewhat, being 2,983,522 barrels during the first quarter as compared with 3,212,833 during the corresponding period of 1887. Should the speculators succeed in maintaining wheat at a high figure for some time longer, flour exports will of course go on diminishing unless Europe improves correspondingly.

### Trusts and the Tariff.

Among the curious features of the tariff debate is the recurrence in the remarks of the reformers of a table of "trusts" designed to strike terror into the minds of all fair-minded citizens. Eighteen of these vicious organizations are enumerated, the table giving a column showing the average percentage of protection of the trusted articles, a column of figures professing to give the amount of the bonus per hundred dollars of product, to which prices have been adjusted, and third series, stated to be the whole expense for labor in $100 of product. Evidently the table originated at a time when the short-lived fever for trusts raged last winter, and has escaped revision since. We do not know how erroneous it is concerning other lines of manufacture, but, so far as the metal and iron trades are concerned, it is a remarkable monument of credulity and ignorance. Among the awful trusts which are extorting untold millions from the overburdened consumer under the protecting wing of the tariff are the Bessemer steel, plow steel, general steel, nail, general iron, copper, zinc, tin and lead trusts. The Merchant Steel Association, we suppose, is responsible for the first three trusts, when, in fact, it suffers from all the trials and tribulations of a trade combination, resting alone on the good faith of individual manufacturers. The nail trust was once the dream of a few earnest Eastern nail-makers. If a lively fight for orders and active cutting of prices is the precursor of peace under the shadow of a trust, then the realization of their wildest hopes, long since abandoned, is not far off. The general iron trust, whatever it may embrace, has proven its utility by keeping its unfortunate members in the painful dilemma of choosing between the alternative of severing long-established business connections, and discharging a force of men long associated with them, or allowing figures to swell on the wrong side of the ledger. The copper trust, so-called, is based upon the sale of American product to foreign speculators. The tin trust must be the creation of the lively imagination of somebody, since, practically, we do not produce any of that metal. There is no zinc trust so far as we know of. If there is, the management thus far has been wretched, since prices have steadily declined for months, and are now fully one cent under the importing point. What little lead trust there is refers to a pooling of interests and of a smelting concern in New Mexico, refining works and white lead works in St. Louis. We have attached so little importance to it that we have not taken the trouble to follow it for months, since it does not embrace more than 5 per cent. of the whole product of the United States. The other 95 per cent. are now chiefly engaged in selling at as high a price as they can get, while a leading speculator in the metal is holding up values and piling up lead. This disposes of nine of the "trusts," while, certainly, a number of the others have as shadowy an existence. They include salt, earthenware, glass, linseed oil, rubber shoes, envelopes, paper bags and cordage. It is discouraging, to put it mildly, to find a number of our legislators blindly embodying in their speeches, such wretched compilations, which any one of their constituents, even remotely connected with the industries in question would have torn in tatters at short notice.

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On Saturday, the 5th inst., each of the employees of Carnegie, Phipps & Co., Limited, and Carnegie Bros. & Co., Limited, of Pittsburgh, received a copy of a circular, offering to receive such portion of their earnings as they may wish to deposit with the company, not to exceed $2000 for any one account. Six per cent. interest will be allowed on all deposits. All or any part of deposits can be lifted by giving notice on any pay-day. Payment of such sums will be made upon the following pay-day. They will continue to lend money on mortgage to their workmen who desire to build homes for themselves, and will place in the hands of a trustee all such mortgages and those they now hold upon property advanced upon to their men, as an additional security for such sums as may be deposited with them. Carnegie Bros. & Co., Limited, have issued the same circular. In an interview with a member of both firms as to the object of the proposition and how it originated, the following facts were learned: "By way of prelude I will state that several years ago, when the firm of Carnegie Bros. & Co. first took hold of the Edgar Thomson Works, a number of the workmen wanted us to take their money and pay them interest for it—or, in other words, do just as we propose to do in the present instances. We refused to accept the proposition at that time because we were just starting in business, and such action on our part might create the impression that we were hard up for cash and were resorting to that means to raise funds. Now it is different, as any person acquainted with our firms knows we do not have to borrow money. Then, again, we propose to pay our men per cent. interest for all money placed with us. Now, if we were in need of cash, we could easily borrow from the banks at that rate of interest." It is stated that the proposition is not meeting with much favor among the workmen, and it is thought very few of them will accept it.

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On Wednesday, the 9th inst., the iron and steel manufacturers at Pittsburgh met at the rooms of the Iron Association in that city to consider the question of wages for the coming year. Messrs. Chas. H. Zug, Geo. F. McClean, A. E. W. Painter, Geo. A. Chalfant, D. B. Oliver, John Walker and Jas. K. Verner were appointed a committee to formulate a scale for presentation to the Amalgamated Association of Iron and Steel Workers at the earliest possible date. On Friday last circulars were sent out to all the members of the Iron Association, notifying them of the appointment of the Scale Committee and requesting them to suggest any changes they desire to make in the present scale of wages, and also to express their opinion as to the basis of the scale for the year beginning July 1. Every manufacturer was particularly requested to send in some expression of opinion, as the Scale Committee think this a particularly important year.

# The Mechanical Engineers.

## Meeting at Nashville.

**Wednesday, May 9.**

Wednesday morning the members proceeded to Vanderbilt University, in the outskirts of Nashville, where the session was opened with a paper by Prof. Robert H. Thurston, who presented his views on "Proportioning Steam Cylinders." This was essentially mathematical in character, Professor Thurston confining himself to the problem of determining the best form of steam cylinder, and the type and proportions of an engine for which the power, steam pressure and ratio of expansion are settled. A number of formulæ and table of constants to be used in connection with them were given, enabling the designer to calculate very closely the right size of engine for a desired power.

A written discussion from Mr. G. H. Babcock was read, in which he took exception to Professor Thurston's paper, on the ground that it involved an unnecessary amount of calculation. He held that practical experience gave the best data and instanced a case he had worked out, arriving at results closely corresponding with what Professor Thurston had derived, but in a much simpler manner.

A paper on

CONNECTING RODS,

by Mr. W. F. Mattes, was next in order, Mr. Mattes directing attention to a form of rod which was adopted by him at the Lackawanna Works. It differs from the ordinary "marine" rod, first, in having jaws of sufficient length to hold both boxes; and, second, in having a cap which hooks over projections on the jaws. These projections are turned concentrically with the rod, and the cap hooks are counterbored to match. The cap is thus held in position by the combination of hooks, box-flanges and bolts; but the long jaws and the counterbore of the cap relieve the bolts of any other duty than merely clamping the parts together, and no particular accuracy need be observed either in turning the bolts or drilling the holes for them. As compared with rods having the outer box secured by a transverse bolt passing through eyes in the jaws, several advantages are claimed. The flat parallel sides of the head facilitate the operations of forging and finishing; the tensile stresses are taken by bolts, in which the required strength can be easily and certainly secured, instead of by eyes, of uncertain condition, cut out of a large forging; an unsightly swelling at the end of the rod is avoided, and the weight sensibly reduced. Rods with the transverse bolt are frequently seen with flat-sided heads, but the result is achieved by a disregard of nicety in proportioning which is allowable only in small sizes. For the main rods of locomotives having two pairs of drivers, the transverse bolt is most convenient, but this is a special case, and the precedent should not be blindly followed. As compared with the old strap-rod, the new form has been found cheaper to fit up and better in use. As compared with the solid-head rod, the open end is a great convenience, except on crosshead ends where the pins are removable; the jaws hold the boxes with equal rigidity, permit the use of full flanges on both boxes, and do away with loose collars on the crank-pins.

This was followed by a paper by Mr. C. C. Collins, on "A New Method of Inserting and Securing Crank Pins." This we published last week. In the discussion Mr. J. T. Hawkins remarked that there was a possible weakness in the fastening described, due to the reduced length of

the bearing of the pin in the crank. The discussion then drifted on to the shrinking method of fastening pins and tires, the allowance to be made in such work and the weakness that sometimes ensued from overstraining. Mr. G. H. Bond read a table from a circular issued by the American Railway Master Mechanics' Association, from which it appeared that the average shrinkage allowance for tires of locomotive drivers was $\frac{1}{16}$ inch for each foot of diameter. He also showed that this figure approximately corresponded to the present German practice. Prof. J. E. Sweet closed the discussion by describing an interesting occurrence that had come under his observation, in which an attempt had been made to remove the axle from a locomotive driving-wheel, but without success until the tire was cut off, when it was found that the axle could be removed by hand, showing that the compressive strain of the tire had been transmitted through the cast-iron spokes and jammed the axle in the hub.

The meeting then adjourned and the members then visited the several buildings of Vanderbilt University, inspecting the laboratories, workshop, &c., and were also present at the laying of the corner stone of the new building for the department of mechanical engineering, which, it is expected, will be ready for occupancy next fall. The members enjoyed a lunch provided at the University, and in the afternoon, under conduct of the local committee, who were untiring in their efforts to make the visit of the mechanical engineers to Nashville in every way agreeable, went by special train to Belle Meade. Here they were most cordially welcomed and entertained by General Jackson, who conducted them over his widely famous stock farm.

**The Evening Session.**

The first paper read was by Mr. Geo. H. Barrus, entitled "The Effect of Circulation in Steam Boilers on the Quality of the Steam" dealing with a somewhat remarkable experience as regards priming in a small boiler used for heating, and the remedy which was applied.

Professor J. M. Whitham sent a written discussion in which he detailed a closely similar experience with the boilers of the United States steamship Galena. In the course of the discussion following, the question was raised by Mr. A. F. Nagle, as to whether the priming was not due to the short length of the tubes, but it was pointed out in reply that in fire-engine boilers the tubes are sometimes not more than 11 inches long, and yet give no trouble from this source. Several members took part in the discussion, and Prof. H. B. Gale incidentally suggested that in a properly designed boiler, where there was perfect circulation, perhaps there was no actual ebullution, but that the water, instead of forming bubbles along the tubes, ascended unchanged and only turned into steam at the surface.

This was followed by a short paper, by the same author on "The Performance of a Compound Engine," the engine consisting of two unjacketed cylinders placed side by side and connected with an unheated intermediate receiver. The results of the tests given were based on the quantity of steam exhausted from the engine, the condensed water discharged from the surface condenser being measured for this purpose. Steam was furnished by Harrison sectional boilers, after first passing through an ample sized steam drum. The average indicated horse-power developed was 606.53, and the total steam consumed, including that used by a circulating pump, was 44436.3 pounds. The steam consumed per indicated horse-power per hour was 16.28 pounds, and the coal consumed per indicated horse-power per hour, based on stipulated evaporation, was 1.63 pounds.

This provoked considerable discussion on the curves of the indicator diagrams accompanying the paper.

The last paper on "An Electric Speed Recorder," also by Mr. Geo. H. Barrus, described an instrument similar to a Morse telegraph register, in which there are two recording pens, each worked independently by an electro-magnet. The record is made upon a paper ribbon which is moved by clockwork. The magnets are operated by the alternate making and breaking of the electric circuits in which they are placed. In one case the circuit is made and broken by the oscillating movement of the escapement wheel of a clock, and this occurs 120 times per minute, or once in a half-second. In the other it is done by the revolution of the engine shaft, which is arranged so that during half of the revolution the two ends of the circuit are in contact, while during the remaining half the circuit is broken. The records consist of two lines of short indentations or dashes, made in the paper ribbon, and these lines are parallel to each other and $\frac{3}{4}$ inch apart. The time record is made up of dashes about $\frac{1}{8}$ inch long and $\frac{1}{4}$ inch apart—that is, about $\frac{1}{4}$ inch from center to center. The dashes making up the speed record are about $\frac{1}{16}$ inch long. and about half as far apart as those of the time record. The number of revolutions which take place during any desired period of time is determined by drawing perpendicular lines through the centers of those dashes which mark the beginning and end of the interval, and counting the number of speed dashes and fractions which lie between these lines. The record appears to be reliable to as small a fraction of revolution as one-tenth. The instrument, we understand, operated satisfactorily at a speed of three hundred revolutions per minute.

Professor Sweet expressed the wish that all the high-speed engines at present made might be tested by some such accurate recorder, as he believed it would be found that their speed was by no means constant from second to second. Topical discussions followed, and several were passed over with little or no attention. The question, "To what extent does electroplating reduce the temper of highly-hardened steel?" was, however, the inspiration of a very interesting discussion on the peculiar and apparently causeless breakages of pieces of tempered steel. Mr. G. R. Stetson mentioned a curious instance of a small piece of steel which broke apart at night while lying in the shop and the fracture of which showed no flaw or weakness of any sort. He also advanced the theory that the molecules within the steel kept altering position and adjusting themselves for an indefinite length of time. Mr. A. K. Mansfield referred to a case of a die made of steel exploding spontaneously, and other similar instances were related. As to the effect of electroplating on the temper of steel, no members expressed any very decided views, while a number questioned whether there really was any such effect produced. The closing topical discussion was on the question, "How much should be removed from the edges of punched or sheared steel plate to cut away the injured metal?" Mr. J. T. Hawkins described his experiments with a belt made of steel strips and the plan he adopted of simply rounding the corners of the strips to prevent their cracking. Mr. J. H. Cooper presented a written discussion, in which he summarized the recommendations of several eminent authorities.

**Thursday, May 10.**

The first paper presented at the morning session was on "Surface Condensers," by Prof. Jay M. Whitham. This paper was of considerable interest, and while we cannot undertake to consider it at any length at the present time its scope can be well indicated by quoting the heads of the different parts into which it was divided. These were: 1. Origin and Nature of the Surface Condenser; 2. Reasons for Using or not Using a Surface Condenser; 3. Joule's Experiments with the Surface Condenser; 4. Isherwood's Experiments on Conductivity of Metals; 5. Nichol's Experiments with Condenser Tubes; 6. Methods of Designing Condensing Surface; 7. Proposed Formula for Condensing Surface. The formula which Professor Whitham suggests i :

$$S = \frac{17\ W}{180}$$

S being the surface in square feet and W the total number of pounds of steam condensed per hour.

After the reading, Secretary Hutton showed the members samples of brass pipes which had been used in condensing sugar vapors, and which illustrated a peculiar form of corrosion. The zinc in the brass had evidently been attacked by the vapors and completely eliminated, leaving a brittle copper shell. In corroboration of this, Mr. Nagle stated that all brass work about a sugar refinery was subject to corrosion, and had to be protected by paraffin, or by some other means. Coal gases it was further stated, sometimes produced similar effects.

A very important and interesting paper, by Mr. J. S. Coon, was then taken up. It was entitled

DUTY TRIALS OF PUMPING ENGINES,

and furnished, in concise form, valuable suggestions for the carrying out of such tests. Mr. Coon very aptly remarked that like the horse-power of a boiler the word "duty," as applied to a pumping engine, or at least the work of the pumping engine as applied to the word "duty," admits of vexatious and embarrassing elasticity. Exactly what is meant by the word, as it appears in water-works contracts, is very rarely clearly defined, and there is thus left to the discretion of the expert who makes the contract duty test, the acceptance or rejection of certain allowances and other variables, which materially affect the final tabulated result. Mr. Coon made no attempt to lay down complete directions for conducting a test, but rather called attention to some important features which are often neglected, and to others upon which there is lack of harmony in their treatment. We shall take pleasure to go into Mr. Coon's paper more fully in an early issue.

It was favorably commented on by Mr. Barrus in a written discussion. Mr. Barrus after pointing out the necessity of making uniform tests offered the motion that a committee of the society be appointed to formulate a standard method of testing pumps.

There was some discussion as to whether the committee should simply recommend a set of rules, or whether they should establish them, and finally by the voice of the meeting it was decided that the committee should simply draw up the rules without attempting to enforce them.

A very interesting and bulky collection of matter relating to the Strong locomotive was given in the next paper, which was by Mr. F. W. Dean, on

THE DISTRIBUTION OF STEAM IN THE STRONG LOCOMOTIVE.

Mr. Dean made use, in part, of the figures collected by Mr. J. S. Coon during his trial of the engine last year, referred to in our columns at the time. Seven locomotives were considered, one being the regular Strong engine, known as No. 444; another, No. 383, fitted with an ordinary boiler and the Strong valve gear and cylinders; No. 357, having an ordinary anthracite-burning boiler, Stephenson link

motion and D valves, with De Lancey's balancing device; two others were similar to No. 357; still another was a bituminous coal burner, with ordinary boiler, Stephenson link motion and D valves, and, finally, an English locomotive, with bituminous coal burning boiler and a Stephenson gear working directly on the valve-stems and D valves. Mr. Dean described the Strong gear in detail with the aid of many engravings and presented also a large number of comparative indicator diagrams. Referring specially to the first three of the above-mentioned engines, the following figures for actual consumption of water per indicated horse-power per hour were given: No. 357, 26.021 pounds; No. 383, 23.25 pounds; No. 444, 27.01 pounds.

The average actual water consumption of No. 444 was thus more than that of No. 357. This is inconsistent with the consumption of steam as deduced from the diagrams from the indicator, and is, therefore, to be credited to the boiler and the personal equations of the men in charge.

Notwithstanding that the boiler was obliged to evaporate so much water, it did it with an average evaporation of 7.41 pounds of water per pound of coal, while the boiler of No. 357, which was a 54-inch wagon-top boiler, evaporated on the average 6 pounds per pound of coal, or the evaporation of No. 357 was only 81 per cent. of that of No. 444. The average evaporation of No. 383, which has a 55-inch straight-top boiler, was 5.52 pounds of water per pound of coal, or only 74½ per cent. of that of No. 444. These comparisons show the great efficiency of the Strong boiler over the common type. The efficiency of the Strong boiler, while the water consumption was very high, brought the coal consumption down to an average of 3.64 pounds per indicated horse-power per hour, while those of Nos. 357 and 383 were respectively 4.33 and 4.24. That is to say, whether working upon water or steam, 444 used 84 per cent. of the coal required by 357 in developing one horse-power and 86 per cent. of that required by 383. This shows the economy of No. 383 to be due to the valve gear and that of No. 444 to the boiler. The true test of the gear is found in the results from the cards, which are independent of the boiler performances. These results show the consumption of dry saturated steam by No. 383 to be $81\frac{6}{10}$ per cent. of that of No. 357, and the consumption of steam by No. 444 to be 95 per cent. of that of No. 357. There is no apparent reason why No. 444 should not equal No. 383, because the cylinders and valve-gears of the engines are identical, except that No. 444's cylinder is 1 inch larger in diameter than No. 383's.

This paper gave rise to an animated discussion between Messrs. Barrus and Coon. The former in a written discussion intimated that too much was claimed for the Strong locomotive, and questioned some of Mr. Dean's comparative deductions. Mr. Coon defended the author's statements, and expressed a firm belief in the superior efficiency of this new type of locomotive.

A paper on "Strains in Locomotive Boilers," by Mr. L. S. Randolph, was then taken up. The failure of locomotive boilers by cracking in an apparently mysterious manner caused Mr. Randolph to take special interest in the subject, and as a result of his study he presented illustrations of several cases of fractured stay bolts and cracked flanges with suggestions as to how they might be avoided.

A rambling discus ion ensued on the corrosion of tie-bolts, in which various opinions were expressed as to the most common point of breakage of such rods, and Mr. Harvey Middleton mentioned that in the Belpaire boiler less trouble was experienced with breaking tie-bolts.

Following this came a paper by Mr. William L. Clements, entitled, "Steam Excavators." The appliance considered was the portable land machine, with the machinery mounted on a base or car body supported by wheels for propulsion. Mr Clemens handled the subject in a very interesting manner, giving general and detail views, records of performance, &c.

It was followed by a paper on "River Practice in the West," by Mr. J. M. Sweeney, in which the steamboat of the Ohio and Mississippi rivers was reviewed. Plans and elevations of hulls and machinery were given, the whole, we should add, being confined entirely to the stern wheeler.

Several members took part in the entertaining discussion that ensued, and it appeared to be the general opinion that for the peculiar physical and financial conditions met with in Western river steamboat practice the present type of boat was not ill adapted.

**Thursday Afternoon**

the members spent in visiting points of interest and inspecting the new Nashville water reservoir, which is in process of building. The reservoir on the crest of the hill, some two miles from the city, is almost elliptical in shape and is to have a capacity of 50,000,000 gallons. It is being built by Whitsit & Adams, of Indianapolis, by whom the visiting members were entertained.

**The Evening Session**

on Thursday began with the reading of Mr. H. de B. Parsons's paper on "The Displacements and the Area Curves of Fish," which was followed by Prof. J. E. Denton's paper, "Mechanical Significance of Determination of Viscosity of Lubricants." Of this we publish an abstract elsewhere in this issue. Commenting on it Mr. Wilcox suggested a graphical method as an improvement on tabulating results, especially for quick comparison of oils. His plan was to attach a pencil to the end of the rod carrying a piston descending in a cylinder of oil and trace a line on the drum of an indicator rotated by clock-work. The degree of the angle made by the traced line with the horizontal is thus a measure of the viscosity of the oil. The third paper of the evening was by Mr. F. A. Scheffler on "A Foundry Cupola Experience," which we published last week. The discussion turned mainly on methods of utilizing the waste heat of a cupola, and in reply to a question as to the use of earthenware pipe for carrying blast under ground Professor Sweet mentioned a case in which such a plan was adopted with satisfactory results.

Mr. A. F. Nagle followed with a paper on

THE BEST FORM OF NOZZLES AND DIVERGING TUBES.

Mr. Nagle pointed out that in studying any prescribed form of nozzle we would naturally turn to the line of acceleration from which to judge of its fitness or merit. If we take the ordinary straight-taper nozzle, and construct therefrom a line showing the acceleration at all points of its length, we should be much surprised by its extreme variation. It is well known that such nozzles do not give good practical results. The stream of water is not solid when it leaves the nozzle, and it is soon broken into a spray. Diagrams were presented illustrating this point. Several improvements on the straight-taper nozzle were considered and tables were given showing the velocities at different points of their lengths, with corresponding diameters and accelerations. Mr. Nagle further presented a formula for calculating the acceleration for known extreme diameters and lengths of nozzle, constructed upon the theory that the acceleration should be uniform throughout the length of the tube. The same theory was applied to diverging tubes.

Mr. Jacob Reese in his paper on "The Tetiabasic Phosphate," which was then presented, directed attention to the preparation and uses of the new compound $(4\,CaO)\,P_2O_5$, produced in dephosphorizing steel by the basic process. Its value as a fertilizer was specially emphasized, Mr. Reese presenting an imposing array of figures to substantiate his claims.

Mr. Hewitt contributed a discussion confirming the statements in the paper as to the fertilizing value of basic slag. Professor Thurston's paper, "Large and Enlarged Photographs and Blue Prints," published last week, was accompanied by written discussions from Mr. A. F. Hall and Mr. Fawcett. The former objected to Professor Thurston's method on the ground that the board is apt to warp and give unsuccessful prints, as would also be the case unless the felt were of uniform thickness. During the verbal discussion attention was drawn to the cumbersomeness of the device, and an arrangement of double rollers was described with which a print of any length may be made by slowly unwinding it from one roll and winding it on to the other.

Mr. Wilcox referred to a blue print taken by this method at the Altoona shops of the Pennsylvania Railroad, which was some 75 feet in length. The next paper was by Prof. J. B. Webb. The object of Prof. Webb's paper, entitled, "A Persistent Form of Gear Tooth," was to develop a formula for the wear of teeth applicable to all possible forms, and the equations of condition for a persistent form of tooth.

After this Mr. Wm. Hewitt read a paper entitled "Wire Rope Fastenings," which we will present in an early issue. The meeting was then brought to a close.

**Friday, May 11.**

Early Friday morning the members went by special train to South Pittsburg, Tenn., and after lunch were taken by Mr. Chas. W. Richards to the recently-constructed Perry Stove Works, where 5 acres of ground are under roof. The members next went to the South Pittsburg Pipe Works and later visited the South Pittsburg blast furnace plant of the Tennessee Coal, Iron and Railroad Company. The plant comprises three blast furnaces of a nominal capacity of 100 tons each, two of which were in blast at the time, and the third banked, though only for a few days. From the furnaces the members under charge of Col. A. M. Shook, general manager of the company, went by train a few miles in the mountains to the Inman iron mines of the Tennessee Coal, Iron and Railroad Company. The ore is the red fossiliferous variety and carries from 30 to 35 per cent. of iron and sufficient lime to make it self-fluxing. Returning from the mines the members went on the same evening to Chattanooga, and on Saturday a local committee conducted them to the various points of interest about the city. The Citico Furnace which had been blown in a few days previous was first visited, and then the party proceeded by special train to Missionary Ridge. The afternoon was spent on Mt. Lookout, from which a magnificent view of Chattanooga and surrounding country was obtained.

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Vice-President and General Manager McLeod, of the Philadelphia and Reading Railway, has issued a circular to the employees of the road, forbidding any "to use improper or undue influence for the purpose of securing members for labor organizations," under penalty of instant dismissal.

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Three of the largest mills in Fall River, Mass., employed on textiles, are reported to be running up a large annual deficit in consequence of their inability to compete with modern machinery.

# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 95 and 97 Washington St., CHICAGO, May 14, 1888.

**Pig Iron.**—It is the experience of many dealers that the past week was one of the dullest in this market for years. Very few report sales of any considerable size. A general belief is entertained that prices are not yet at bottom, and as long as this impression is prevalent it is hopeless to expect consumers to buy more Iron than they absolutely need to cover pressing requirements. The trade is in such a condition that most furnace companies seem convinced of the futility of attempting to force business by offering further concessions, and it is probable that a wholesale restriction of production will soon be inaugurated if an improvement does not take place in the demand. Some of the Southern manufacturers, it is true, are pursuing a different policy, and are offering their Mill and Bright grades at lower prices than last week in order to work off accumulated stocks, but they are assisting the inclination to lower figures for their higher grades. Among the manufacturers of Lake Superior Charcoal Iron a tendency to restriction of the supply is manifesting itself in several ways. Strong companies propose to pile their Iron and await a return to better prices, while others will make but a short run this summer and then blow out if no improvement sets in by that time. The Ore situation is not favorable to the manufacture of much cheaper Iron than is now being produced. The small Lake Superior mines will very generally lie unworked this season, and many of the large ones will greatly reduce their output. The competition between the mining companies is, therefore, less than was anticipated, and in consequence of this the sellers of Ore are withdrawing some of the low quotations made within the past two or three weeks. If, as indicated, the price of Ore has reached a point below which it cannot be depressed the curtailment of the production of Pig Iron will be hastened. Usual quotations for small lots are now as follows, for cash, f.o.b. Chicago: Lake Superior Charcoal, all numbers, $20 @ $20.50; Alabama Car-Wheel, $26.50; Southern Charcoal Foundry, No. 1, $18.50 @ $19.50; Jackson County Softeners, No. 1, $18.50 @ $19; Hocking Valley, Soft Foundry, No. 1, $18.50 @ $19; American Scotch, No. 1, $19.50 @ $20; other Ohio Scotch Irons, No. 1, $18 @ $19; Lake Superior Coke, No. 1, $18 @ $18.50; No. 2, $17 @ $17.50; No. 3, $16.50; Southern Coke, No. 2, $17.50; No. 2½ and Open Bright, $17; No. 3, $16.50; No. 1 Mill, $16; No. 2 Mill, $15.50.

**Bar Iron.**—Very little has been sold recently and inquiries are rare. Prices on mill orders continue at the figures reported last week—namely, 1.65¢, half extras, for inferior quality, and 1.68¢ @ 1.70¢ for good Common Iron, f.o.b. Chicago. The price from store ranges from 1.80¢ to 2.10¢ according to quality and quantity, with an occasional sale at a shade lower to the best classes of customers.

**Structural Iron.**—Specifications are in hand for the Ironwork for a number of buildings and for some bridges, but there is no haste to close contracts. Clark, Raffen & Co., Kingsbury and Ohio streets, have made arrangements to handle the entire product of the North Chicago Rolling Mill Company in Steel Beams and Channels. Store prices are as follows, according to quantity: Angles, 2.40¢ @ 2.70¢; Tees, 2.60¢ @ 2.90¢; Beams and Channels, 3.80¢. Mill prices for carload lots are as follows, f.o.b. Chicago: Angles, 2.25¢ @ 2.30¢; Universal Plates, 2.35¢; Tees, 2.55¢ @ 2.60¢; Beams, 3.40¢.

**Sheet Iron.**—Inquiries from heavy buyers are increasing, and the probabilities favor large purchases from the mills within a week or two. For mill shipment No. 27 Common Black is quoted at 2.90¢ @ 3¢, f.o.b. Chicago, while it is held at 3.30¢ from store. Galvanized Iron is moving a little better than last week, but trade is not brisk. Small lots are still quoted at 60 % off for Juniata and 60 % and 5 % off for Charcoal, but prices of large lots are slightly easier.

**Plates, Tubes, &c.**—A somewhat hopeful feature of the situation is the refusal of several mills to renew contracts at very low prices, which have recently expired. A fair trade is in progress from store, and plenty of work is in sight for which material will soon be needed. Store quotations continue as follows: Heavy Sheets, Nos. 10 to 14, 2.70¢; Tank Iron, 2.60¢; Tank Steel, 2.75¢ @ 3¢; Shell Iron, 3¢; Shell Steel, 3¢ @ 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 60 @ 62½ % off on 2½-inch and larger, and 57½ % off on 2-inch and smaller.

**Merchant Steel.**—An improving demand is noted, particularly for Tool Steel. Store quotations are as follows: Bessemer Bars, 2.45¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.65¢; Open-Hearth Spring, 2.90¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢.

**Steel Rails.**—Very little new business has been taken since our last report, but negotiations are pending for round lots, contingent upon the result of financial arrangements. Prices remain nominal at $33.

**Old Rails and Wheels.**—The supply of Old Iron Rails is growing larger. Round lots are offered at $20, but the largest consumers bid only $19. For small lots $20.50 is asked. A sale of a few carloads of Old Car-Wheels was made at $19. More are offered at $19.25, but buyers are scarce at present.

**Scrap.**—Business is very dull and prices are lower. Steel Scrap is more of a drug than ever, the demand for it having been so light for months that every dealer has a stock which constantly keeps accumulating. Mixed Steel Scrap is probably worth not over $9 ℔ ton. Dealers are paying $12 for Mixed Country Scrap. Their selling quotations for carefully selected are as follows ℔ ton of 2000 lb: Railroad Shop or No. 1 Forge, $18 @ $18.50; Track, $17; No. 1 Mill, $13.50; Light Wrought, $8.50 @ $9.50; Horseshoes, $18; Axles, $23.50; Machinery, Cast, $14; Stove Plate, $11; Cast Borings, $9.50; Wrought Turnings, $12; Axle Turnings, $13; Coil Steel, $13; Leaf Steel, $15; Locomotive Tires, $15.

**Nails.**—Reports of very low prices for Steel Cut Nails are current, which are attributed to the necessity of some mill to realize on its output and not to general demoralization. Regular prices for mill shipment are $1.97½ @ $2, f.o.b. Chicago, but jobbers generally are waiting for lower prices before they stock up. The manufacturers of Wire Nails have made a reduction in their prices, finding it impossible to maintain such a wide difference between Wire and Cut Nails. The local demand for all kinds of Nails is reported by jobbers to be dull and heavy, with very little doing in carload lots. They quote small lots of Steel Cut Nails at $2.15, and Wire Nails at $2.75, but these prices are shaded to suit circumstances.

**General Hardware.**—The condition of the farming interest is reflected in the demand for Hardware. The abundant rains throughout the West have so improved the agricultural prospect that the demand has very perceptibly quickened for Farming Tools and such other articles as are needed in rural communities. Jobbers therefore are able to report a larger volume of trade than for the previous week. No change in prices has occurred that is worthy of note, except in solder, which has fallen to correspond with the drop in Pig Tin. Some weakness is observeable in Tin Plates also. The tendency in almost all staple goods is still downward, as was remarked in our last report. Collections are as good as usual at this season.

**Barb Wire.**—Nothing new has occurred in this line. A fair business has been done in small lots, the nominal quotation for which is 3.25¢ for Painted and 4¢ for Galvanized.

**Pig Lead.**—Consumers are disposed to hold off and transactions have been limited to carloads. Prices receded from 4.35¢ to 4.10¢, closing at 4.05¢.

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Charles E. Marlor, who has for several years managed the Structural-Iron business of Milliken & Co., 115 Dearborn street, Chicago, has severed his connection with that firm and connected himself with Clark, Raffen & Co., Kingsbury and Ohio streets, manufacturers of Architectural Iron Work. Mr. Marlor will be succeeded by D. Forsythe Morris, from the office of Milliken Brothers, New York. Milliken & Co. represent the Phœnix Iron Company, of Philadelphia.

M. T. Miles & Son, agents for Anderson, Du Puy & Co., of Pittsburgh, and other Iron and Steel manufacturers, have removed from 50 La Salle street, Chicago, to room 208, Phœnix Building, corner Clark and Jackson streets.

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## Chattanooga.

Office of *The Iron Age*, Ninth and Carter Sts., CHATTANOOGA, TENN., May 14, 1888.

A view of the general business of the South develops about the same conditions that have existed for some time back, with the exception perhaps of the Pig Iron interests. The various manufactures are running full, with plenty of orders ahead—in fact, sufficient to justify the probability of a full season's work. The volume of business being done by the merchants and commission men is as large as ever, but profits are being reduced to a very small minimum, hence shorter credits are more popular than ever, and the demand for money greater, especially with those who do not have much surplus capital.

**Pig Iron** has shown little change either in price or demand, and the market seems to have settled down to a steadier basis. There have been several sales of quite large lots of Nos. 2 and 3 Foundry of late, but, of course, on private terms. Carload and 100-ton lots are ranging from $14.50 to $16.50, according to reputation and grading, and we also note a more active demand for the good brands of Car-Wheel Pig, which is bringing $19 @ $21 at the furnaces, with a number of large sales at these figures. The Round Mountain Furnace, of Alabama, has again blown in, and is now turning out about 25 tons of Cold Blast Charcoal, which is finding a ready market among the Car-Wheel makers. The product of this furnace obtained an excellent reputation during the war as a very superior ordnance metal. Citico is again at work with her usual output of 80 to 90 tons per day. It is the intention of her owners to run her mostly on Foundry grades, which heretofore have always found a ready market in New York.

**Miscellaneous.**—An important event of the past week has been a visit of the

Society of Mechanical Engineers to this city, who appear to have enjoyed themselves very much in visiting the different industries of the city and of the surrounding districts.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, PA., May 15, 1888.

The general condition of the market does not show much improvement, probably the reverse, if the position was critically examined. There are a few spots of something approaching steadiness, but there are more in which weakness predominates, while along the entire line dullness reigns supreme. The outlook is considered gloomy in the extreme, and is rendered still more so because of the uncertainty in regard to the tariff. Business is bad enough, and seems likely to remain so for a long time, but, even under favorable circumstances improvement would be impossible while the tariff question is unsettled. Consequently, there is nothing whatever upon which to predicate any change for the better for some time to come. The main point with producers is to adjust their cost in proportion to the changed conditions of the market, which, at best, holds out but little encouragment to those who are endeavoring to meet its requirements.

**Pig Iron.**—The market is a shade steadier than it was a week ago, and although not quotably lower, better Iron can be had for the same money. Many of the very low-priced Irons are either sold up or are withdrawn from the market, so that low quotations are not as frequently met with as they were a few days ago. Some of the best brands, however, are made available to the right kind of buyers on specially favorable terms—equivalent in some cases to 50¢ or $1 ℔ ton reduction. This, in all probability, has brought prices down to a point at which they will make a stand for some time to come, although, if Southern and Western brands are sold down in proportion, Pennsylvania Irons may have to be shaded again. At present prices, however, the last named have the preference, although Ohio Irons are pushing No. 1 Foundry very closely, and in cases in which Southern brands have proved satisfactory they, too, are not easily crowded out. But there is great irregularity in prices, making it almost impossible to quote with anything like exactness. The general range for tidewater deliveries is about as follows: No. 1 Foundry $19 @ $20; No. 2 do., $18 @ $18.50; and Gray Forge, $16 @ $17. Some of the largest buyers may possibly be able to fill their requirements at inside figures for the best brands, but in ordinary cases medium or outside rates are generally quoted. All depends on the quantity required, when it is required, terms of payment, amount of orders on sellers' books and the kind of competition that has to be met. Southern Irons are not offered at prices likely to make sales probable to any great extent, nor is there much disposition to buy; so that the stand-off is mutual for the present. Prices are about $15, $16.50 and $18 @ $18.50 for the three numbers, but there is very little new business to report. Summarizing the entire Pig-Iron market, it may be said that makers of the best brands have marked their prices down to a point which makes ordinary brands seem high enough in proportion, and it is doubtful if they can make another cut so as to place them in competition with favorite local brands. At the same time it must be conceded that there are certain brands from Alabama and Virginia and Ohio which have established a very enviable reputation in this market, but, of course, they are held at prices in proportion. The question now is not so much one of price as it is quality at the price, and, as already stated, buyers appear to have had all the advantages in this respect during the past week.

*By Telegraph.*—The reductions in the price of foundry Irons by the Thomas Iron Company is exciting great interest today. Some take the ground that it is a wise move, and by placing values in a line with Western and Southern markets it will put a stop to shipments from these sources. Others think that the cut is too deep and that many will decline to meet the Thomas quotations, and as they can only supply limited quantities the effect will not be of long duration. Meanwhile the market is very unsettled.

**Foreign Iron.**—Nothing doing. Prices are too high for this market, and negotiations are in abeyance for the present. Asking prices about as follows: $19.50 @ $20 for 20 % Spiegel.

**Blooms.**—A moderate amount of business is reported at about the rates quoted herewith for domestic Blooms, including sales of a good sized lot of Rail Blooms. Nothing doing in foreign, so that quotations under that heading are more or less nominal. We quote domestic Rail Blooms, $28 @ $28.50, and Slabs and Billets from $30 to $35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, $52 @ $54; Run-out Anthracite $43 @ $44; Scrap Blooms, $35 @ $37 ℔ "bloom" ton of 2464 lb. Foreign at tide, c.i.f., duty paid, $30 @ $31 for Nail Slabs; $31.50 @ $32.50 for 4 x 4 Billets, and $35 @ $39 for Siemens-Martin, price according to analysis, &c.

**Muck Bars.**—The market is extremely dull and prices are not very uniform, although $28 @ $28.50 at mill is the usual quotation for good Bars, but some less favorably located quote about $27.50 for what they call a good quality of Muck Bar.

**Bar Iron.**—There is not much in the way of improvement to notice, although in some quarters a more active demand is noticed. In fact, business is not so scarce, but prices are unprofitable, largely because of the extraordinary low quotations made by parties in the interior. Local mills making a first-class quality of Iron cannot, and do not, quote less than 1.9¢, but it is a well-known fact that a great deal of Iron is being brought from the interior at 1.75¢ to 1.8, under the designation of Best Refined Iron. What the actual quality is we are not in a position to state, but it seems to pass inspection, and to that extent may be satisfactory to the buyer, although none of our local manufacturers feel like guaranteeing quality at the figures named. Skelp Iron is a trifle more active, with several sales during the week. Asking prices are 1.82½¢ @ 1.85¢, with one very desirable order refused at a fraction below 1.8¢. Prospects seem to indicate a better business in this branch of the Iron trade and prices likely to be maintained at the figures above quoted.

**Plate and Tank Iron.**—A little more business has been scattered around, but not sufficient to cause any improvement in prices. Some of the leading mills are tolerably well filled up, however, and, with further increase in the demand, it is not unlikely that an effort would be made to lift prices out of the unremunerative condition in which they have been for so long a time. Meanwhile there are plenty of anxious sellers and, on good sized orders, there is no difficulty in shading prices, which are nominally about as follows: Ordinary Plate, 1.95¢ @ 2.05¢; Tank, 2¢ @ 2.10¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.3¢ @ 2.4¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 4¼¢.

**Structural Iron.**—Some heavy purchases have been made, including something like 8000 tons in one lot, besides a similar quantity on an old contract, for the Union Bridge Company, for use in the construction of bridges in Connecticut, Southern Illinois and other distant points. The greater portion of this order, however, has been taken by mills at a distance, so that it will not have much influence locally. Still the outlook is thought to be better, and the chances for full employment during the summer months are somewhat encouraging. Prices are about as follows (although on large lots a good deal of shading is being done in a quiet way), say 2.05¢ @ 2.10¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.7¢ @ 2.8¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

**Sheet Iron.**—Business is very slow and prices irregular, varying according to quality, quantity, &c. Small lots are quoted at about the following rates for best makes:

| | |
|---|---|
| Best Refined, Nos. 26, 27 and 28 | 3¼ @ 3½¢ |
| Best Refined, Nos. 18 to 25 | 3 @ 3¼¢ |
| Common, ¼¢ less than the above. | |
| Best Bloom Sheets, Nos. 26 to 28 | 4¼ @ 4½¢ |
| Best Bloom Sheets, Nos. 22 to 25 | 4 @ 4¼¢ |
| Best Bloom Sheets, Nos. 16 to 21 | 3¾ @ 3¾¢ |
| Blue Annealed | 2.8 @ 3 ¢ |
| Best Bloom, Galvanized, discount | 60 % |
| Common, discount | 65 % |

**Steel Rails.**—Not much doing and prices are weak at from $31 to $32 at mill. Lots of a few hundred tons each are taken occasionally, but there is no demand for large lots. Mills are busy on other specialties, however, so that the falling off in the Rail trade is not as serious as it would be under other circumstances.

**Old Rails.**—Demand and supply are both light, and the only transaction reported within a week was 500 tons T's yesterday at $21.50 in store, which figure fairly indicates the condition of the market.

**Scrap Iron.**—There is very little demand and sales are chiefly in small lots at about the following quotations: $19.50 @ $20.50 for shipments of cargo lots; $20 @ $21 for carload lots, delivered, or for choice $21.50 @ $22; No. 2 do., $14 @ $15; Turnings, $13 @ $14; Old Steel Rails, $19 @ $20; Cast Scrap, $14 @ $15; do. Borings, $9 @ $10; Old Fish Plates, $25 @ $26. Old Car-Wheels, $17 @ $18, Philadelphia, or its equivalent.

**Wrought-Iron Pipe.**—Mills are well supplied with orders, but prices remain weak and unsatisfactory. This branch of the Iron trade has been greatly overdone, and the large capacity for production which was fully employed a year or two ago now exceeds the requirements of the trade, hence competition and low prices. Discounts are quoted as follows: Black Butt-Welded, 50 %; on Galvanized do., 45 %; on Black Lap-Welded, 65 %; on Galvanized do., 50 %; Boiler Tubes, 60 %.

**Nails.**—The general features of this department remain unchanged. Only a limited quantity of Nails are being sold and at very irregular prices. At the meeting of the Eastern Association, held in New York last week, a committee was appointed to confer with the Western mills in regard to the proposed changes in schedule, and to report at the next monthly meeting of the association.

## Louisville.

LOUISVILLE, KY., May 14, 1888.

**Pig Iron.**—The market has been quiet during the past week, with but few sales and those for delivery within 60 days. No sales have been made at prices lower than those of the last two weeks, but there are indications that if large purchases should be made, present prices could be shaded slightly. Several parties were on the point of making purchases to run through six months, but on carefully reviewing the situation felt that they were not justified in so doing, believing that later on they will

be able to do better. The demand for old material continues quiet, purchases being made for short deliveries.

| | |
|---|---|
| Southern Coke, No. 1 Foundry | $17.00 @ $18.00 |
| " No. 2 " | 16.00@ 17.00 |
| " No. 2½ " | 15.50 @ 16.50 |
| Hanging Rock Coke, No. 1 Foundry | 17.50 @ 18.50 |
| Hanging Rock Charcoal, No. 1 Foundry | 21.00 @ 22.50 |
| Southern Charcoal, No. 1 Foundry,. | 18.00 @ 20.50 |
| Silver Gray, different grades | 14.50 @ 15.50 |
| Southern Coke, No. 1 Mill, Neutral. | 14.50 @ 15.50 |
| " No. 2 " " | 14.00 @ 15.00 |
| " No. 1 " Cold Short | 14.00 @ 15.00 |
| White and Mottled, different grades | 13.50 @ 14.50 |
| Southern Car-Wheel, standard brands | 20.50 @ 21.50 |
| Southern Car-Wheel, other brands. | 18.50 @ 20.50 |
| Hanging Rock, Cold Blast | 22.50 @ 23.50 |
| Hanging Rock, Warm Blast. | 18.50 @ 19.50 |

## Pittsburgh.

Office of *The Iron Age*, 77 Fourth avenue, PITTSBURGH, PA., May 15, 1888.

The industrial situation has undergone no material change during the past week. The general Iron trade continues in an exceedingly unsatisfactory condition, and the outlook for any early improvements not as encouraging as it might be. There are a great many contingencies upon which the future is more or less depending, and these are exerting a depressing influence. Labor complications and tariff agitation have had much to do with the present unsatisfactory condition of the Iron business; a great many contemplated improvements have been held back, and the season is so far advanced now that some of them will be held over till next year. River navigation has been fully resumed, and the packets, which for a time were unable to take full trips, owing to scant water, are now able to take full cargoes. River navigation is a matter of great importance to the people of the Ohio Valley, and it is not strange therefore that they are very much in favor of river improvement.

**Pig Iron.**—Some of our best posted men say that the Pig Iron trade is worse now than it has been at any time since 1873. Not only is the demand very small, but there is nothing in the business to either producer or consumer. Consumers have been getting a reduction in price on almost every purchase they have made for several months past, and while the market continues in its present condition it is not to be expected that they will feel like anticipating future wants. Within the past week sales have been made at a further reduction in price, and there is no assurance that bottom has been reached. Consumers are nearly all low in stock, but they will not increase the same until they have pretty good evidence that prices have touched the lowest point. Quotations may be fairly made as follows:

| | | | |
|---|---|---|---|
| Neutral Gray Forge | $14 50 @ | $15.00, | 4 mos. |
| All Ore Mill | 15.50 @ | 16.00 | " |
| No. 1 Foundry | 17.50 @ | 17.75 | " |
| No. 2 Foundry | 16.75 @ | 17.00 | " |
| No. 3 Foundry | 15 75 @ | 16.25 | " |
| Cold Blast Charcoal | 25.00 @ | 28.00 | " |
| No. 1 Charcoal Foundry | 24.00 @ | 25.00 | " |
| Bessemer Iron | 16.50 @ | 16.75, | cash. |

Sales Neutral Gray Forge at $14.75 @ $15.25, four months; no sales of Bessemer reported, but there is not much doubt but what an offer of $16.50 would be accepted.

**Muck Bar**—Continues dull, and while we make no change in our quotations, the market is weak at $26.50 @ $27, cash. So far as we are advised there have been no sales below $26.50, and a good many mill owners refuse to accept a fraction under $27, cash, notwithstanding the reduced cost of the raw material. In not a few instances contracts are taken at so much ₱ ton for doing the puddling, the Pig Iron being delivered at mill of the maker and taken away when converted into Muck Bars. Some mill owners are doing this in order to keep their puddlers employed and thereby prevent them from seeking work elsewhere.

**Manufactured Iron.**—There is no material change to report in the situation, business continues dull and unsatisfactory, and the outlook for improvement soon does not appear encouraging. Not only is the demand poor for the season of the year, but prices continue unsettled and unremunerative. Buyers are still impressed with the belief in still lower prices, hence they are carrying no more stock than they can possibly help.

**Nails.**—There is no improvement to note in the Nail trade, which is very unsatisfactory both in regard to demand and price. Pittsburgh manufacturers are refusing to sell below the regular price, $1.90, 60 days, 2 % off for cash in carlots and upward, but as buyers can do better elsewhere, there is not much of a demand here. It is stated on good authority that Wheeling manufacturers are offering to sell at $1.77½, and it is intimated that they would no doubt accept $1.75. Pittsburghers claim that there is little or no margin for profit at $1.90, and they are at a loss to know how Wheeling can afford to sell for so much less. It is admitted that it does not cost any more to make Nails here than at Wheeling, nor has Wheeling any advantage over Pittsburgh in the matter of transportation, yet it is true, we believe, as stated, that Wheeling is cutting prices. It is said that most of the Wheeling factories are stock concerns, while the actual management of the same is in the hands of salaried officers, whereas the Pittsburgh factories are owned and controlled by firms, who having their own money invested refuse to run their factories at a loss.

**Wrought-Iron Pipe.**—The Pipe trade continues in an exceedingly unsatisfactory, and unsettled condition, and the outlook for an early improvement is not as encouraging as it might be. As yet neither natural gas nor oil companies appear disposed to buy freely, and but few of the mills are running up to anything like their full capacity. Some of the natural gas companies in Ohio and Indiana have been deterred from doing much by threats to have the Legislatures of those States enact laws in regard to charges to be made to consumers for natural gas. The companies, as might be expected, are very much opposed to any legislation of the character in question, and, as already stated, they are not disposed to do much in the way of putting down Pipe until they have some more definite assurance in regard to the matter in question. Prices for all kinds of Pipe continue very unsatisfactory and irregular, and there does not appear to be much prospect of any immediate improvement.

**Old Rails.**—The market for Old Iron Rails continues very dull, and prices are lower. American Tees are being offered at $22.50, without finding buyers. The report sent from New York last week in regard to Pittsburgh consumers having bought 5000 tons from the Erie Railroad at $24, delivered in Pittsburgh, is not correct. For some time past they have been buying only as their immediate wants required, and it is not to be expected that they would pay $24 for large blocks in the present condition of the market when small lots were being offered at $1.50 ₱ ton less. We can report sales 600 tons Old Steel Rails at $20 @ $20.50 gross ton.

**Billets.**—Bessemer Steel Billets may be quoted at $28 25 to $28.75 cash as to size, quality and delivery, sales of 2000 tons at $28.60 @ $28.75 delivered at mill of buyer. We can also report a sale of Blooms at $28.90 and Plate Slabs at $28.80, Domestic Rail Crops, $17.50 @ $18; American Wire Rods, $41.50 @ $42.

**Railway Track Supplies.**—There is not much inquiry for this season of the year. Prices remain about as last quoted, Spikes, $2 @ $2.15, 30 days, delivered Splice Bars, $1.80 @ $1.85; Track Bolts, $2.85 with square and $2.95 with hexagon Nuts.

**Merchant Steel.**—Tool Steel, 8½¢ ₱ lb; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Open-Hearth Machinery, 2¾¢.

**Old Material.**—We can report sales of No. 1 Wrought (Railroad) Scrap at $20, net ton; Cast Scrap at $16.50, gross; Old Car-Wheels, $20, gross; Old Car Axles quotable at $25 @ $26, net ton; Wrought Turnings, $13 @ $14; Cast Borings, $11.50 @ $12.50, gross.

In the notice published in our issue last week regarding the formation of the partnership of Preston & Humphreys, at Pittsburgh, the types made us say that the new firm was composed of Percy Preston and G. A. Humphreys. We are informed that this was an error, as the members of the new firm are Percy Preston and W. Y. Humphreys.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, May 14, 1888.

**Pig Iron.**—Some little improvement is reported in the temper of the local market for Pig Iron, but trade is still more conspicuous for slowness and easiness than for animation and strength. More encouraging views, however, are entertained for the future by sellers and there is more disposition to take hold at low prices by buyers, yet the volume of business is not much increased and is made up of an aggregate of small orders rather than by large trade. Mill Iron is more freely offered than other kinds and for that reason larger transactions are made in Mill grades. Car-Wheel Iron continues especially scarce and wanted. Southern Foundry Iron, too, is in much better demand than supply and it is difficult to secure Iron enough to fill an order of 500 tons. Moderate amounts of No. 2 Southern Coke Foundry sold at $17; 1000 tons Mixed Nos. 1 and 2 and Close Bright Ohio Iron sold at $14.50, equivalent to $14.75 for No. 1 Mill; also about 5000 tons No. 1 and No. 2 Mill sold at inside quotations. Prices current here for cash, with further revision, are as follows:

| | |
|---|---|
| *Hot-Blast Foundry.* | |
| Southern Coke, No. 1 | $17.50 @ $18.00 |
| Southern Coke, No. 2 | 16 50 @ 17.00 |
| Southern Coke, No. 3 | 16.00 @ 16.50 |
| Ohio Soft Stone Coal, No. 1 | 17.00 @ 18.00 |
| Ohio Soft Stone Coal, No. 2 | 16 50 @ 17.00 |
| Mahoning and Shenango Valley | 17 00 @ 18.00 |
| Hanging Rock Charcoal, No. 1 | 20.50 @ 22.50 |
| Hanging Rock Charcoal, No. 2 | 19.00 @ 21.00 |
| Tennessee and Alabama Charcoal, No. 1 | 18.50 @ 19.50 |
| Tennessee and Alabama Charcoal, No 2 | 17.00 @ 18.00 |
| *Forge.* | |
| Strong Neutral Coke | 14.00 @ 15.00 |
| Mottled Neutral Coke | 13.50 @ 14.00 |
| No. 1 Mill Coke | 14.75 @ 15.00 |
| No. 2 Mill Coke | 14.25@ 14.50 |
| *Car-Wheel and Malleable Irons.* | |
| Southern Car-Wheel | 20.00 @ 23 00 |
| Hanging Rock, Cold Blast | 22.50 @ 25.00 |
| Lake Superior Car-Wheel and Malleable | 21.00 @ 22.00 |

**Manufactured Iron.**—A few mills report a little improvement in the demand for Manufactured Iron during the week, which was readily met at previous prices; an easy tone still prevails. Bar and Sheet Iron—Common Bar Iron, 1.90¢ @ 2¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ ₱ lb.

**Nails**—Have been more freely offered, and a little irregular, with a discount of 10 ¢ to buyers of round lots. The jobbing trade has been moderate at the following quotations: 10 to 60d Iron sell-

ing at $2.05 ℔ keg, and other sizes at proportionate rates. Steel sell at $2.10 and Steel Wire at $2.80 ℔ keg.

**Old Rails and Wheels.**—There has been a larger and more active inquiry for both Rails and Wheels during the week, and the market has improved in tone. Sales of several 100-ton lots of Old Wheels have been made at $19, $19.50 and $20, mainly at $19.50 ℔ ton. Old Rails have been sought for at low prices, and the close is firmer; the quotable prices are $20.50 @ $21; 1000 tons Southern Rails sold, delivered in Covington, Ky., at $20.85 ℔ ton. If the word "Wheels" be substituted for "Rails," and *vice versa*, in last week's report that which was intended will be evident.

## Cleveland.

CLEVELAND, May 14, 1888.

**Iron Ore.**—Two vessel loads of Ore arrived yesterday—the first receipts of the season. One came from St. Ignace and the other from Escanaba. The transactions of the past six days have been confined to 5000 and 10,000 ton lots at the figures given last week. Additional sales of Menominee Bessemers are reported at $5 and a few lots of non-Bessemers from the same range have been bought at the mines at prices equivalent to about $4 at Cleveland. Gogebic Bessemer sales are known to have occurred at figures below $5.25, but the exact price obtained is closely guarded. Few really large sales have occurred during the past week, although the aggregate amount of Gogebic Bessemer sold would probably amount to 75,000 tons. One buyer claims to have been offered a substantial block of Ore from one of the best mines in the Gogebic region at $5.10, f.o.b. vessel at Cleveland. More Minnesota Ore has been sold at $6 ℔ ton. The following seem to be the established quotations:

| | |
|---|---|
| No. 1 Specular and Magnetic Ores, Bessemer quality | $6.00 @ .... |
| No. 1 Specular and Magnetic Ores, Non-Bessemer quality | 5.00 @ .... |
| Red Hematite Ores, Bessemer quality | 5.00 @ .... |
| Red Hematite Ores, Non-Bessemer quality | 3.75 @ $4.25 |
| Menominee Range Ores, Bessemer quality | 5.00 @ .... |
| Menominee Range Ores, Non-Bessemer quality | 4.00 @ .... |
| Gogebic Range Ores, Bessemer quality | 5.00 @ .... |

**Pig Iron.**—Few additional sales are reported, but the inquiry for the better grade of Foundry Irons, and for Bessemer Iron generally, is heavier than for several weeks past. Buyers who have steadily maintained that prices would go still lower seem, at last, to be convinced that bed rock has indeed been reached. A prominent inland furnaceman returns our letter of inquiry indorsed: "The outlook has certainly improved. The furnacemen are beginning this season right. They are buying Ore and Coke at figures which, if they are maintained, will permit us to make a little something out of our season's work. With Coke at $1 ℔ ton and Ores $1 cheaper all around than last year we hope for an early revival of the Pig-Iron market."

**Old Rails.**—The few sales that have occurred have been on a basis of $22 for old Americans. Old Wheels are quoted at $20.50.

**Manufactured Iron.** — The market shows some life, but prices are as low as ever. Sales of Common Bar at $1.65 are reported.

[*By Telegraph.*]

A good-sized block of Ore from the Cleveland Mine has been sold at $5.25. Sales of Menominee Range Ores this week will aggregate 100,000 tons. Furnacemen offer $5 for Gogebic Bessemers to-day and expect to buy at that price. Colby Mine Ore can now be bought at $4.75; sales are being reported at that price to-day.

## New York.

**American Pig.**—A sensation was created by the announcement, on Tuesday, of a reduction of $2 in the price of the Iron of the Thomas Iron Company, to $18 for No. 1, $17 for No. 2 Foundry and $16 for Gray Forge, delivered at tidewater. Mr. B. G. Clarke, president of the Thomas Iron Company, states that these prices apply to all season contracts entered into some time since for the delivery of Iron during 1888. It is understood that the motive for this reduction was to check the competition of Southern and Western Irons in territory supplied from the Lehigh. The Thomas Iron Company had to date closed for delivery during 1888 for about 120,000 tons. Last year their furnaces produced 176,000, and with good working ought to make 180,000 tons annually. During the close of last year and the first months of 1888 the Lehigh strike caused some loss of output. Still the company have Iron to sell, but Mr. Clarke states that he will supply only his own customers at present prices, and they are expected to call for the entire product. The struggle for trade had for some time since caused a steady decline, which was most marked in Philadelphia, Albany, points in Northern New York and New England. It had carried values for Iron equivalent to standard brands down to $19 for No. 1, $18 for No. 2 and $16 for Gray Forge, with outside Irons selling even below those figures. Practically the new price announced is a cut of $1. To some extent, at the present writing, the trade is still at sea as to the effect which the announcement will have. It will probably be followed at once either by a readjustment of prices on contracts for which deliveries are still to be made or a cancellation of such contracts. That is the alternative which is at once presented to sellers who wish to hold trade. Outside of the Thomas Iron Company few of the Lehigh, Schuylkill, New Jersey and New York furnaces have season contracts running, chiefly for the reason that buyers have preferred to buy from hand to mouth. The greatest urgency to secure sales for forward delivery was on the part of Southern furnaces. Considerable Alabama Iron was sold on the basis of Thomas Iron, the buyer being guaranteed a margin under the latter, whatever prices were fixed. In the case of such contracts the Southern furnaces will, of course, carry out their agreement. In some instances they have sold large blocks at private but probably low prices to commission merchants, who have been distributing the Iron in smaller lots. It is generally believed in the trade that some arrangement will have to be made on all such running contracts. It is probable that to some producers this may be a heavy blow. As yet it is too early to determine whether the lower prices will stimulate a buying movement. That will show itself first in the reports of new sales by the Thomas Iron Company, who are understood to have a part of their 1888 product still unsold. The opinion is freely expressed in the trade that the first effect of the announcement will be to make buyers doubly cautious, at least so far as their dealings are concerned with those who do not follow the policy of securing the buyer against any decline. The question is raised, too, whether or not the level now reached is really the bottom. If there is to be a trial of strength between the leading Lehigh company and the producers of Pig Iron in Virginia, Alabama and Tennessee, questions of cost may disappear, and the struggle may degenerate into war. Already one of the leading Virginia companies, as sellers in this section, the Lowmoor, have announced their decision to meet the cut. As bearing on the question, it may be broadly stated that so far as the Thomas Iron Company are concerned present prices still leave a fair margin, especially when the recent reduction in costs, amounting to about $1.25, is taken into consideration. It is stated on the very best authority that the Thomas Iron Company can deliver their Iron, without loss, for about $15, $14 and $13 for the three grades at tidewater, of course putting in their own Ores at cost. Deducting freight, $3.86, commission, and about 50¢ for difference in selling price, $17 for Lehigh No. 2 at New York is equivalent to about $12.50 at furnace in Birmingham, Ala., which is not far from cost for the average of the grades for those not owning Ore and Coke. Possibly this may be lowered by reducing freights and wages for mining Ore and Coal, labor at the furnaces, &c., though the latter might not proceed without friction. The Virginia furnaces are somewhat better situated, and are regarded in the trade as the more formidable competitors in this section, upon which they are more exclusively dependent for a market, however, than those of Chattanooga and Birmingham, who have their chief outlet to points west of the Allegheny Mountains, so far north as Detroit and St. Paul, and so far west as Kansas City and Omaha. Lately the Eastern markets were considered relatively better than Cincinnati, Louisville and Chicago. That is probably now reversed, and some of the pressure will be transferred to those markets, to which must be added that caused by the shutting out of Shenango Valley and Mahoning Valley Irons. The position of the latter may be judged by the following figuring, taking Albany and Troy as the competitive point. The freight from tidewater to Albany on Lehigh Irons is 60¢, which would put them there at $18.60 for No. 1. To meet this the Mahoning Valley has a rate of $2.70 from Youngstown, Ohio, which would net $15.75 @ $15.90 for No. 1 in the Mahoning Valley. So far as the New England markets are concerned, the position of the Southern furnaces is relatively better. The rate from Birmingham to Boston is the same as to New York, $3.86, while the Lehigh furnaces pay $1 to 1.50, averaging $1.25. To the extent of the freight, therefore, they retain an advantage. So much for the position of the chief contestants. What stand they will take the near future will develop. In the meantime it must not be forgotten that the reduction means serious pressure upon the smaller concerns on the Lehigh and Schuylkill valleys in New Jersey and New York. The recent reductions in the cost to the first named are inadequate to meet the emergency which has arisen. A good many of them must blow out, at least those making a specialty of Foundry Irons. The majority of them do not make more than 1000 to 1500 tons a month, yet in the aggregate their production is quite considerable. It remains to be seen whether it is so great as to seriously influence the supply, and thus bring about quickly a healthier condition of affairs. Individually the majority of them are too weak to take a hand in the contest now waging. Their withdrawal from it would appear to be the wisest course to pursue. Our Philadelphia correspondent telegraphs the views of the trade at that point. From Birmingham, Ala., we have the following dispatch: "Southern Iron makers attach no special importance to the matter just now. Some think that Mr. B. G. Clarke should have kept up the price of Foundry Iron for his own good, and put Gray Forge down further, since the competition is on the latter." Reports here show more clearly now how sharply the Southern furnaces have been cutting. We have been shown records of sales of No. 2 at $17.25. Representatives of Southern furnaces here insist that they are ready to meet the cut, and go lower if necessary, to hold trade once captured. The Thomas

Iron Company had this morning received a batch of letters from consumers commending the course taken.

**Scotch Pig.**—There has been some activity, with the market steady at $20.25 @ $20.50 for Coltness, $20 @ $20.25 for Summerlee, and $18.50 @ $18.75 for Dalmellington.

**Bar Iron.**—We quote for carload lots, on dock, half extras, Common 1.65¢ @ 1.7¢; Medium, 1.7¢ @ 1.75¢ and Refined, 1.75¢ @ 1.9¢.

**Structural Iron.**—The contract for the extensions of the Brooklyn Bridge have been placed with two near-by mills. These contracts foot up to about 1600 tons. The Union Bridge Company have placed orders aggregating 7500 tons of Structural Iron, 5000 tons thereof going to Pittsburgh. Beside this we note a lot of 8000 tons not yet reported. We quote: Angles, Iron and Steel, 2.1¢ @ 2.25¢; Tees, 2.6¢ @ 2.7¢; Channels and Beams, 3.3¢, on dock. Bridge Plates continue 1.9¢ @ 2¢.

**Plates.**—The market is still irregular. We quote: Tank, 2¢ @ 2.10¢; Shell, 2.15¢ @ 2.4¢; Steel Tank, 2.2¢ @ 2.4¢; Shell 2.15¢ @ 2.25¢; Flange, 2.6¢ @ 2.75¢, and Fire-Box, 3¢ @ 3.25¢. The lower figures are being made by mills rolling Steel Plates from imported Slabs. Steel Sheets, No. 16 Foreign, are quoted at 2.15¢ @ 2.25¢.

**Steel Rails.**—The market has been very quiet, with only a few lots of 500 and 1000 tons placed by Eastern mills. We quote: $30.50 @ $31 for standard sections, at Eastern mill. No sales of any magnitude are reported from the West. The report of the Board of Control shows sales to May 1st of 721,000. There has been some correspondence about increasing the allotment, which has led to opposition thereto.

**Wire Rods.**—Wire-drawers are buying only from hand to mouth, but the sale of small blocks for early delivery amounts to a fair aggregate. We continue to quote $40.50 @ $41.

**Old Rails.**—There have been sales of lots in store aggregating fully 5000 tons, chiefly to Eastern manufacturers, who have been picking up cheap lots at $20 @ $20.50. A sale of 500 tons of Doubles is also noted. Lately a lot of 3000 tons of Doubles, which had been imported from India, was re-exported to England. The stock here is growing light and what there is left is chiefly held by strong parties; $20.50 is now bid for Tees on cars.

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N. S. Bartlett & Co., Pig Iron, and selling agents of Langloan (Scotch) Pig Iron, have removed to Room 7, No. 52 Wall Street.

Benjamin Atha & Co., Incorporated, of Newark, N. J., announce that the firm of Benjamin Atha & Co. has been dissolved and a corporation has been formed under the same name. The new company will operate the works at Newark, and have purchased, in addition, the plant of the Jersey City Steel Company and leased their premises. Additions and improvements are to be made to increase the efficiency of the plant, the management being in the hands of Mr. Atha. An announcement to this effect, indorsed by the Jersey City Steel Company, has been sent to the customers of the company. Mr. Benjamin Atha is president and James Lancey secretary of Benjamin Atha & Company.

## Metal Market.

**Copper.**—Chili Bars improved in the London market on Thursday of last week from £80 to £80. 17/6 on the spot and from £75 to £76. 10/ futures, the sales reaching 450 tons, while here but little transpired on a very steady market, 25,000 lb May being sold at 16.60¢. On Friday a further improvement was cabled to £82. 5/, spot, and £78, futures, sales amounting to 325 tons, prices gaining 10 points here, May being quoted at 16.70¢, and the week winding up with a strong tone. The advance in London made some headway on Monday, when spot Bars were sold at £83 and futures at £78. 10, sales summing up 325 tons, and in this city the market displayed a moderate degree of activity, accompanied by firmness, sales figuring up 200,000 lb, at 16.70¢ for spot, 16¾¢ for May, 16.70¢ for July and 16.60¢ for September; yesterday London had a recoil to £82. 10/ spot, and £77. 5/ futures, our own market remaining steady and active, some 600,000 lb being taken at 16.70¢ for spot, 16.70¢ for May, 16.70¢ for June, 16.70¢ for July and 16.60¢ for August. The seller was a broker who recently issued a confidential circular to manufacturers offering 1,000,000 pounds which he claimed to control, as an aid toward fighting the syndicate. He claimed to control additional quantities of "outside" copper. The market has had the support during the past week of the syndicate, and prices have been advanced it is claimed to coerce recalcitrant manufacturers into entering contracts. It appears that some contracts have been made between lake companies and rolling and Wire mills at 16.50¢. Sales were made at the Metal Exchange to-day on first call of 25,000 lb July, at 16.70¢; 25,000 lb June at 16.65¢, and 25,000 lb July at 16.60¢, closing strong at 16.70¢ on the spot. Chili Bars are cabled £83 this morning, and Best Selected £80. The export of Ingot Copper from the United States during the first nine months of the fiscal year was 18,809,506 lb, against 12,949,758 lb during the preceding year. On the Paris Stock Exchange Rio Tinto shares rose 4⅝ francs on Monday and receded 1½ yesterday. The visible supply of Copper in England and France, on May 1, was 64,141 tons, against 59,040 on April 1 and 52,709 on March 1, an increase of over 20 % in two months, the deliveries during the first four months not exceeding 21,315 tons, as compared with 28,980 during the corresponding period of last year, a decrease of 30 %. From this country alone Liverpool and Swansea received during the first four months 8983 tons Fine, against 1112 last year, and from all sources, Chili excepted, 19,385 tons, against 9961, about doubling the supply. The Tharsis Sulphur and Copper Company, of Huelva, declared for last year a 10 % dividend, against 7½ % for 1886. The Rio Tinto Company have declared a dividend of 17/ ℔ share (£10) for the last half of 1887, making, with the dividend of 3/ for the previous half year, 10 % for the year 1887, against 3 % for 1886. Mason & Barry's dividend is 8/ for the last half of 1887, making 5 % for 1887, against 2½ % for 1886. The secretary announces that a contract was signed on the 19th ult. between the company and the Société des Métaux for sale, at a fixed price, of the company's shipments of Copper Precipitate from that date to the end of 1890, after deducting such quantity as may be required during the remainder of this year for completing contracts previously entered into. The Panulcillo Copper Company, of Chili, have declared a dividend of 10 % for the year 1887. The report states that negotiations with the French buyers for a contract are on the point of completion.

**Tin.**—The scare in Tin reached its climax in London on Thursday last week, when spot gave away from £80 to £79. 12/6 and futures from £80 to £79. 15/, some 70 tons being sold, the nominal quotation here remaining 21¢ spot, and 17¾¢ July. A private circular from Rotterdam states that at the Batavia sale of the 25th ult., when 15,000 piculs Billiton were offered, the syndicate had given no limits to uphold prices, causing a decline of 7 guilders in Holland an hour after this fact transpired, thus starting the collapse. On Friday London recovered to £82 with both spot and futures, sales amounting to 60 tons; here some improvement was also noticeable, some 75 tons changing hands, May, at 18.75¢ @ 19.70¢ and July at 18.25¢ @ 18.60¢. Monday brought an improvement in London to £84, both spot and future, sales reaching 150 tons, without provoking much of a response here, 10 tons June being sold at 19.75¢, spot being nominally quoted 21.75¢ and August 18.80¢. Yesterday both spot and futures rose in London to £85. 10/, while here the market was weak, 10 tons June selling at 19.10¢. This morning London cables spot £85 and futures £85. 15/, and we close quiet at 20.10¢ May and 19¢ June; dealers selling at 22¢ @ 22½¢ in a jobbing way. The visible supply of Tin on May 1 in Europe and America was 23,995 tons, against 11,332 tons on May 1, 1887; the deliveries during the 12 months ended April 30 in Europe and America were 30,108 tons, as compared with 34,119 tons, 33,046, 34,739 and 35,963 respectively during the preceding four years. The net imports of Tin into the United States during the first nine months of the fiscal year were 10,411 gross tons, against 10,918 during the corresponding period of the preceding year. The market closes with 21.10¢ bid and 21.85¢ asked. *Tin Plates*—Have been closely following Pig Tin. For the present, bottom in futures seems to have been reached. Spot stock is not plentiful, and commands a premium; meanwhile the demand is good both for spot and futures. We quote large spot lots as follows: Siemens-Martin Steel, Charcoal finish, $5.10 @ $5.25; ditto, Coke finish, $4.80 @ $4.90; Ternes, which are scarce, $4.35 @ $4.40; Bessemer Cokes, $4.60 @ $4.65 and Wasters, $4.45 @ $4.50; Penlan Grade Cokes, $4.50 @ $4.55. Coke Tins are selling at £13. 3/ in Liverpool. The net import of Tin Plates into the United States during the first nine months of the fiscal year has been 201,333 gross tons, as compared with 171,867 tons during the corresponding period of the previous year, an increase of 17 %.

**Lead.**—Some 500 tons Common Domestic were sold to consumers at $4.20, a small portion thereof perhaps even slightly below this, but the spot quotation in the street is $4.20. Refined is not wanted, and nominally worth 4¼¢. In London Soft Spanish declined from £12. 15/ to £12. 10/, and English Pig from £13. 15/ to £12. 15/. Spanish Lead can now be laid down here at 2¾¢ in bond. The chief operator now holds some 15,000 tons, while the spring trade has not by 30 % come up to what it should have been, and the tariff uncertainties cause hesitation. On the Metal Exchange some 200 tons were sold on Thursday at 4.20¢ @ 4.25¢, spot, and 4.25¢ @ 4.32½¢, May; on Friday 128 tons May at 4.20¢ @ 4.22½¢; on Monday 48 tons ditto at 4.25¢, and yesterday spot at 4.20¢, and 64 tons July at 4.25¢ @ 4.27½¢. At St. Louis the market is quiet at 4¢ and at Chicago at 4.05¢. The market closes dull and weak in this city. At the Metal Exchange to-day 32,500 lb May were sold at 4.17½¢; 32,500 lb ditto at 4.15¢; 32,500 lb June at 4.17½¢; 32,500 lb July at 4.22½¢, and between calls 32,500 lb spot at 4.15¢. The market closes with 4.12½¢ bid and 4.17½¢ asked.

**Spelter and Zinc.**—Only a small trade has been transacted on the spot in Common Domestic, at 4.40¢ @ 4.60¢ as to brand. Silesian is unsettled by the decline in London from £17. 2/6 to £16. 15/. Silesian can now be laid down in New York at 5.25¢. *Sheet Zinc* does tolerably

well, considering the season, at 6.50¢ @ 6.75¢; the stock thereof is light.

**Antimony.**—The market has been steady, with a fair jobbing demand, the quotation for Cookson being 13.75¢, and for Hallett 10.75¢, the latter being worth £45 in London.

### New York Metal Exchange.

The following sales are reported:

THURSDAY, May 10.

| | |
|---|---|
| 25,000 lb Copper, May | 16.60¢ |
| 16 tons Lead, May | 4.32½¢ |
| 112 tons Lead, May | 4.30¢ |
| 16 tons Lead, spot | 4.25¢ |
| 32 tons Lead, spot | 4.20¢ |
| 32 tons Lead, May | 4.25¢ |

FRIDAY, May 11.

| | |
|---|---|
| 20 tons Tin, May | 18.75¢ |
| 10 tons Tin, May | 18.95¢ |
| 80 tons Lead, May | 4.20¢ |
| 10 tons Tin, May | 19.70¢ |
| 48 tons Lead, May | 4.23½¢ |
| 10 tons Tin, July | 18.25¢ |
| 35 tons Tin, July (first half) | 18.60¢ |

MONDAY, May 14.

| | |
|---|---|
| 10 tons Tin, June | 19.75¢ |
| 25,000 lb Copper, July | 16.70¢ |
| 50,000 lb Copper, spot | 16.70¢ |
| 48 tons Lead, May | 4.25¢ |
| 25,000 lb Copper, spot | 16.70¢ |
| 25,000 lb Copper, May | 16.75¢ |
| 50,000 lb Copper, September | 16.60¢ |
| 25,000 lb Copper, May | 16.75¢ |

TUESDAY, May 15.

| | |
|---|---|
| 50,000 lb Copper, spot | 16.70¢ |
| 325,000 lb Copper, May | 16.70¢ |
| 125,000 lb Copper, June | 16.70¢ |
| 75,000 lb Copper, July | 16.70¢ |
| 16 tons Lead, July | 4.25¢ |
| 48 tons Lead, July | 4.27½¢ |
| 10 tons Tin, June | 19.10¢ |
| 25,000 lb Copper, August | 16.60¢ |

WEDNESDAY, May 16.

| | |
|---|---|
| 175,000 lb Lake Copper, July | 16.60¢ |
| 25,000 lb Lake Copper, June | 16.60¢ |
| 25,000 lb Lake Copper, June | 16.65¢ |
| 25,000 lb Lake Copper, July | 16.70¢ |
| 32,500 lb Lead, May | 4.17½¢ |
| 32,500 lb Lead, June | 4.17½¢ |
| 32,500 lb Lead, May | 4.15¢ |
| 65,000 lb Lead, spot | 4.15¢ |

## Coal Market.

The Anthracite Coal trade is quiet, although some improvement is spoken of from week to week. At no time recently has there been any eagerness to buy, the demand apparently being confined to actual wants, with few exceptions. Coal is accumulating to excess at shipping ports, where vessels are scarce. So far as known the companies are holding to their prices. The furnace demand in Pennsylvania is said to have undergone no improvement, and freight rates are unsettled. Quotations are as follows: Wyoming free burning, f.o.b. at South Amboy and Wechawken, Broken or Grate, $3.75; Egg, $4; Stove and Chestnut, $4.25; Reading Hard White Ash, at Port Elizabeth, Lump and Steamboat, $4.25; Broken, $4; Egg, $4.10; Stove, $4.25; Chestnut, $4.15; Pea, $3. Free Burning White Ash is the same, except Broken, $3.75, and Egg, $4. Lehigh Coals are for Lump, $4.50; Broken, $4.20; Egg, Stove and Chestnut, $4.10 ₱ ton, f.o.b. at the loading ports.

The total Anthracite production for the week is 621,000 tons, which is an increase of 69,500 tons compared with the previous week, for although the Schuylkill region reduced its output 17,000 tons and Lehigh 12,000 tons as an effect of reduced time at the mines, the Wyoming comes in with 98,000 tons increase. Since the 1st of January, however, the decrease is 110,000 tons compared with 1887, the aggregate being 11,115,687.

Bituminous Coal is quiet, with a tendency to lower prices, but the season's production is practically under contract.

The Pennsylvania Railroad Company report carrying during the week 218,000 tons of Coal, and during the year 4,072,000 tons, an increase of 465,500. The Pennsylvania Company intends pushing its contemplated Plymouth branch of the Northern Central Railroad to Wilkesbarre.

The Reading reports Coal shipments for the week of 130,000 tons, of which 52,000 went to Port Richmond and Elizabethport. The Philadelphia and Reading Coal and Iron Company have completed arrangements for an additional shipping depot at Port Liberty, Communipaw, N. J., and will abandon their big coal piers at Elizabethport December 1.

The Delaware and Hudson Canal Company last year mined 4,063,586 tons of Coal, and it received from sales of coal $10,100,180, resulting in a profit of $1,800,793, while its railroad business resulted in a profit of $1,109,512.

## Financial.

Accounts respecting business conditions in various sections are conflicting, particularly so in reference to crops, which are now regarded with eager interest. Copious rains in a portion of the wheat belt were both a bain and a boon, for the destruction by floods in the West and in the central valleys tended to offset the benefits conferred. Speculation in wheat was wild, prices touching the dollar mark. That spring wheat will make up the deficiency in the winter yield is considered doubtful. Exports, in any case, are far from promising. Cash wheat is quiet. The supply of wheat in the Northwest is estimated at 25,000,000 bushels, 17,000,000 bushels of it constituting the visible supply for that section. The Bureau of Statistics reports exports of breadstuffs for April, 1888, $7,829,994, compared to $12,546,946 for April, 1887. On the canal wheat freights are only 3¢ ₱ bushel from Buffalo, against an average of 4.6¢ last year. Much surprise was caused on the Produce Exchange by the official announcement of the failure of Gorman & Co., one of the largest cutters and packers of bacon in the New York market for export to the English market. Spot Coffee is strong and in more demand. A factor in the market is emancipation in Brazil. Lard advanced on heavy buying by the English syndicate in Chicago. Spot cotton is steady; demand fair. In cash provisions sales are moderate for the season.

The total bank clearances in 36 cities last week show a decrease of 1.9 %, against a decrease of 1.4 % the previous week; outside of New York an increase of 1.2 %, as compared with last year.

The Stock Exchange markets have been generally dull and lower. On Thursday an advance in the Bank of England rate, accompanied by lessened exports of gold, had a depressing effect and the day following the dullness was intensified by bad weather. On Saturday there was a partial rally on the favorable bank statement. Crop reports of a sensational character were circulated, with speculative objects. Tuesday was another dull day, with lower prices, Reading and Richmond Terminal comprising nearly one-half the business. The bond market continued fair.

Quotations of United States bonds are as follows:

| | | | |
|---|---|---|---|
| U. S. 4½s, 1891, coupon | 107¾ | @ | 108⅛ |
| U. S. 4s, 1907, coupon | 126⅞ | @ | 127⅛ |
| U. S. Currency 6s, 1895 | 121 | @ | .... |
| U. S. Currency 6s, 1896 | 123 | @ | .... |
| U. S. Currency 6s, 1897 | 125 | @ | .... |
| U. S. Currency 6s, 1898 | 128 | @ | .... |
| U. S. Currency 6s, 1899 | 130 | @ | .... |

Of something more than $2,000,000 of bonds offered to the Treasury yesterday, $1,016,050 were accepted at the rates already established. W. L. Bull is the new president of the Stock Exchange.

The advance figures of the Bureau of Statistics, showing the export from the United States in April of cotton, mineral oils and breadstuffs, gives total values of $24,059,915, against $25,275,082 in 1887, a decrease of $1,215,167, or 4¾ %.

An advance of the Bank of England rate to 3 %, and the engagement of $500,000 additional for export, had little effect. As an exchange transaction specie exports afford no profit. Money is extremely easy. Moreover, drafts on this center, to the extent of, say, $10,000,000 or $15,000,000, would only result in larger bond purchases to fill the hiatus. The foreign bankers here generally incline to the opinion that the advance in rates for money in London is only temporary. The market for sterling is quiet at $4.87 @ $4.89¼. The bank statement shows that the banks increased their surplus reserve during the week $4,026,600, and held at the close $22,193,932 in excess of legal requirements, or $18,000,000 more than a year ago. In loans there was a contraction of $1,143,000. As the Treasury payments for the bonds purchased on Friday last will foot up nearly $9,000,000, it is expected that the banks will show an increase in reserves again next week. Railroad earnings for April were very satisfactory, the increase on 106 roads being 3.1 % gross compared with last year, upon an increased mileage of 5½ %. The failure of Wm. T. Coleman & Co., it is now said, promises the creditors no more than 30 % of the entire indebtedness. The total failures reported number 209, against 234 the previous week and 167 for the same time last year. According to the Custom-House report the exports of specie from this port last week amounted to $689,472, making a total of $10,105,000 since January 1, as compared with $9,298,000 for the same time last year, and the imports were $133,800, making the total since January 1 $4,727,000, against $5,035,000 for the same time last year.

Thursday's offers to sell United States bonds to the Government aggregated $7,266,250, and all were accepted, together with bonds received after the formal opening, making the total amount purchased $7,378,250. The total purchases to the 11th inst. are $18,088,000. The cost to the Government, including premium, was $21,665,500. When the offer to buy bonds was issued in April the Treasury surplus, as given in the official statement, was $105,225,000. Since then it has fluctuated between $110,000,000 and 102,000,000. According to Thursday's statement it was $105,400,000, or slightly in excess of what it was when the buying of bonds began, showing that the excess of receipts over expenditures during the period stated was greater by $175,000 than the amount expended in the purchase of bonds. Senator Spooner on Monday introduced a bill authorizing the issue of 2½ % 50-year bonds, such bonds to be exchanged at their face value, with interest, for what is known as Government currency, national bank currency, Treasury notes of the United States and any other class of bonds now outstanding against the Government, and for nothing else. The national debt is not to be reduced below $1,000,000,000 and this amount is to be funded in 50-year bonds, which may be paid at maturity by negotiation, thus keeping $1,000,000,000 of the present national debt as, and for, a basis for the circulating medium of the country.

A press dispatch from Wilkesbarre, Pa., under date of the 13th inst., says: "Pardee & Co., coal operators at Hazleton, have given notice to their employees, the late strikers, that they have decided to return to their old system of monthly payments, as paying twice a month involves too much of extra labor. It is thought other operators will follow the move. It is said the return to the old system is due to the falling off in business at the company's stores. When men were paid every two weeks they did not have to ask credit, but bought for cash. The notice causes more or less excitement in labor circles here."

# British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, May 16, 1888.

The Block Tin market remains in a very puzzling condition. Nothing tangible comes to the surface as regards the position or purposes of the "syndicate," holders and buyers generally refrain from laying in anywise extensive supplies. Agents through whom the "syndicate" formerly operated are doing very little at the present time, and have figured but slightly in the trading of the past week. There is a belief, however, that the "syndicate" have been operating through other parties, and that they purchased the greater portion of the Tin sold on the decline last week. The impression also obtains that the "syndicate" is inclined to keep the market in a ferment, secure further supplies at lower prices, and realize an advance which it is calculated will result later on from increased requirements of consumers. The Tin-Plate makers are experiencing an increased demand for their goods, and larger requirements of Block Tin in that quarter will, it is thought, impart more tone to the market for the metal. However, buyers of Plates hesitate about placing orders of any magnitude until the Tin market assumes more definite form. Orders from the American market have been to a quite liberal total during the past fortnight.

The French syndicate representatives have been operating with more vigor in Chili Bars, and the renewed interest is reflected in a stronger tone to the market. Offerings for prompt delivery have been absorbed quickly, as have also three months' futures, while bids of £80 for fortnight's prompt have appeared daily. It is stated that the vigorous plan of action followed by the syndicate has caused considerable covering of "short" sales. The "bear" interest still experience a scarcity of cash warrants, and the upward movment of prices during the week is attributed by some well-informed parties to competition to cover sales on which deliveries fell due on the 15th inst. as much as to fresh purchases by the "syndicate." There is no evidence of improvement in the demand from consumers, however, and their purchases continue to be restricted to immediate requirements. English smelters who are under agreement with the syndicate to maintain prices are doing so, but find very slow sale for their product. Competitors, outside the combination, undersell them and offer very freely at concessions from the official prices.

The transactions in Furnace Material continue to be on a limited scale and disclose no important change in market values. About 100 tons American Matte, 10 %, sold at 13/6 per unit, and 50 tons Montana Matte, 60 %, went at 14/10 per unit.

The chairman of the Caradon Company is about to visit the mines of the concern, with a view of resuming operations there.

The market for Scotch Pig Iron continues depressed, notwithstanding the fact that there is a good home demand and that prices are on an unusually low level. The continued enormous production and steady accumulation of stock in warrant stores checks speculation and operates against any improvement in prices. It is the general belief that prices will continue to rule low unless makers curtail their output. Middlesboro' Pig is more or less depressed by the condition of the Glasgow market, although the export movement shows a heavy increase and deliveries still exceed the receipts.

Notice has been posted at the Upper Forest Tin Plate Works, Swansea, that contracts with workmen have terminated. There is a dispute between the masters and the workmen. Whether the difficulty will result in a suspension of work or not is uncertain as yet. [NOTE.—These works are among the largest in the trade, 12 mills being operated.]

Dealers still complain of an absence of demand from America for Old Iron Rails, but state that Italy continues to be a good customer and purchasing enough to keep prices steady.

Prices on makers' brands of Scotch Pig are generally lower again, and "warrants" have touched as low as 37/10. Freights from shipping points to the United States are, however, somewhat higher. No quotable change is to be noted on Bessemer Pig, Spiegeleisen or Steel products, but actual sales of Old Iron of most descriptions have been made at somewhat liberal concessions from the prices generally quoted by dealers and brokers. Steel Rails, Blooms, Billets, Rods, &c., are quoted at former prices, but have been in merely fair demand.

**Scotch Pig.**—Prices are again lower on nearly all brands, but there is rather more business doing.

| | | | |
|---|---|---|---|
| No. 1 Coltness, | f.o.b. | Glasgow, | 47/6 |
| No. 1 Summerlee, | " | " | 47/ |
| No. 1 Gartsherrie, | " | " | 44/6 |
| No. 1 Langloan, | " | " | 45/6 |
| No. 1 Carnbroe, | " | " | 39/ |
| No. 1 Shotts, | " | at Leith | 45/6 |
| No. 1 Glengarnock, | " | Ardrossan | 43/6 |
| No 1 Dalmellington, | " | " | 39/6 |
| No. 1 Eglinton | " | " | 38/9 |

Steamer freights, Glasgow to New York, 7/6 @ 10/: Liverpool to New York, 11/3.

**Cleveland Pig.**—Trade has been slow and prices show no improvement. No. 1 Middlesboro', G. M. B., 34/; No. 3 do., 31/3.

**Bessemer Pig.**—Demand continues to run light, but prices have ruled fairly steady. West Coast brands, mixed numbers, 42/6, f.o.b.

**Spiegeleisen.**—The market firm in tone and a very good demand reported. English 20 % quoted 77/6, f.o.b. N. W. England.

**Steel Rails.**—Prices have ruled very steady, but the demand is still rather slow. Standard sections quoted at £3. 17/6, f.o.b. at N. W. England works. Middlesboro' district about 2/6 @ 5/ less.

**Steel Blooms.**—Rather weak tone to the market and demand slow. We quote at £3. 12/6 @ £3. 15/ for 7 x 7, f.o.b. at N. W. England works.

**Steel Billets.**—The market steady, with a fair volume of business. Bessemer, 2¼ x 2¼ inch, £3. 15/ @ £3. 16/3, f.o.b. at N. W. England works.

**Steel Slabs.**—Prices have remained steady and the demand is fair, Bessemer, £3. 15/, f.o.b. at N. W. England works.

**Steel Wire Rods.**—Trade rather slow, but prices steady. Mild Steel No. 6 quoted at £5. 18/6, f.o.b. at N. W. England Works. No. 5 about 2/6 less.

**Old Rails.**—Dull market with prices unsettled. Tees quoted at £2. 16/3 @ £2. 17/6, and Double Heads £2. 18/6 @ £3, c.i.f., New York.

**Scrap Iron.**—Demand very slow and prices weak. Heavy Wrought at £2. 5/ @ £2. 7/6, f.o.b.

**Crop Ends.**—Very little demand and prices weak. Bessemer quoted £2. 2/6 @ £2. 5/, f.o.b.

**Tin.**—A firm though irregular market, with trade demand better. Straits quoted at £85, spot, and £86 @ £86. 10/ for three months' futures.

**Tin Plate.**—There has been a fairly good business at irregular prices. We quote, f.o.b. Liverpool:

| | |
|---|---|
| IC Charcoal, Allaway grade | 15/ @ 15/6 |
| IC Bessemer steel, Coke finish | 12/9 @ 13/ |
| IC Siemens " " " | 12/9 @ 13/ |
| IC Coke, B. V. grade | 13/ @ 13/3 |
| Charcoal, Terne, Dean grade | 12/ @ 12/6 |

**Manufactured Iron.**—The market remains quiet and prices are barely steady. We quote, f.o.b. Liverpool:

| | £ | s. | d. | | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| Staff. Ord. Marked Bars | | | | @ | 7 | 10 | 0 |
| " Common " | 5 | 0 | 0 | @ | 5 | 2 | 6 |
| " Bl'k Sheet, singles | 6 | 5 | 0 | @ | 6 | 7 | 6 |
| Welsh Bars (f.o.b. Wales) | 4 | 15 | 0 | @ | 4 | 17 | 9 |

**Copper.**—Firm for spot, irregular for future Bars. "Outside" sellers B. S. English at less than quotations. Chili Bars, closed at £83 spot, and £75. 10/ three months' futures. Best Selected, £82 nominal.

**Lead.**—Market dull; prices irregular and unsettled. Soft Spanish about £12. 10/ at the close.

**Spelter.**—Prices again lower, but fairly good purchases at the decline. Silesian, ordinary, £16. 10/ @ £16. 15/ at the close.

## The Coke Trade.

While no improvement can be reported in the coke industry, as far as prices are concerned, there has been considerable improvement in demand during the last few weeks, and, should it continue to grow, a slight advance in prices before a great while is possible. As near as can be learned, the average selling price at the present time is $1 per ton. In the last few weeks the question of forming another coke syndicate has been under discussion by several of the operators, but so far nothing has been done. While it is probable that another syndicate may be formed, it is the impression that it cannot be done for some time to come. The output for April aggregated 20,200 cars, as against 18,625 cars for March, an increase of 1575 cars for April, which had only 25 working days, while in March there were 27 working days. The average daily shipments, therefore, rose from 690 to 808 cars, an increase of nearly 18 per cent. The shipments for April were distributed as follows: West of Pittsburgh, 12,600 cars; Pittsburgh and rivers, 2000; east of Connellsville, 5600. The figures for March were: West of Pittsburgh, 12,000; Pittsburgh and rivers, 2675; east of Pittsburgh, 4000. As will be noticed, the chief increase has been in the shipments to the East. The resumption of work at the Edgar Thomson Steel Works occurred too late in the month to materially affect shipments to Pittsburgh, but as these works are now running double turn, with five of their seven blast furnaces in operation, the shipments to Pittsburgh during the present month will show a substantial increase, as they consume about 100 cars of coke per day, equal to the product of 1000 ovens. The H. C. Frick Coke Company, who are really a Carnegie concern, have the contract for supplying this large demand, and are running their various works full time in order to fill it. Of the 12,468 ovens in the Connellsville region, there are 2711 idle ovens, or about 22 per cent. of the entire number. At the present time the region is practically free from strikes, and while there is no fixed scale of prices for work, the men seem to be glad to have work at the best prices they can get for it.

The Pottsville (Pa.) Iron and Steel Company have given their 600 employees of thiir Fishbank rolling mill notice of a 10 per cent. reduction of wages, to take effect on the 21st inst. The employees have not yet announced their acceptance or rejection of the reduction.

# Hardware.

Business continues in fair volume and without special developments. It is frequently referred to as rather quiet, but it is to be remembered that manufacturers and jobbers alike are disposed to characterize it in this way unless they are unusually pressed with orders. Prices are substantially as at our last report, ruling quotations being in most lines about as low as the goods can well be afforded, except such as are regulated by combination among the manufacturers, in which cases more remunerative prices are realized. There is more or less complaint in regard to collections, which in many sections are referred to as rather slow.

## Barb Wire.

The New York market remains without especial change, prices being well maintained, with a very satisfactory demand. Some of the mills report that they are exceptionally full of orders, and the prospect for business during the remainder of the season is regarded as gratifying. Quotations are as at the last writing: 4 cents for Galvanized Four Point in carload lots; 4.15 cents in 3-ton lots, and 4.30 cents in small parcels.

The meeting of the manufacturers of Barb Wire, to which we referred in our last issue, held at the Tremont House, Chicago, on Friday, the 4th inst., was largely attended, and was one of the most harmonious in the history of the business. It was unanimously resolved to omit the meeting which had been proposed to be held in St. Louis on the 28th inst. After a general discussion the meeting unanimously resolved to leave the interests of the Barb Wire business in the hands of a committee of five chosen from their number. This committee is to decide all questions which may come before them with reference to prices and other matters, and to have the power to call a general meeting whenever in their judgment it seems wise to do so. At a subsequent meeting of this committee it was decided that, unless there were new developments, no changes should be made in prices for the present.

## Wire Nails.

The price of Wire Nails in this market remains substantially as at our last report on the basis of $2.70 for carload lots, small lots being held at a proportionate advance. Slight concessions from these prices are, however, reported on large Western orders. The Eastern Association are in session in this city to-day, the meeting being well attended, most of the principal Eastern manufacturers being represented.

## Cut Nails.

The New York market has shown a fair degreee of activity, although the irregularity repeatedly alluded to still continues. We quote carload lots of Iron Nails on dock $1.90 @ $1.95, with shading by a few mills, and $1.95 @ $2 from store for small lots.

The proposed schedule which the Eastern Nail makers have been discussing for some time past, but which has not yet been adopted, is as follows:

| | |
|---|---|
| 10d. to 30d | Base |
| 8d., 9., 40d., 50.d, 60d. and 70d | 25¢ extra |
| 6d. and 7d | 50¢ extra |
| 4d. and 5d | 75¢ extra |
| 3d | $1.50 extra |
| 3d, fine | $1.75 extra |
| 2d | $2.25 extra |
| 2d., fine | $4.00 extra |

| | 3d. | 4d-5d. | 6d. | 8d. | 10d. |
|---|---|---|---|---|---|
| Coopers, Slating, and Tobacco, extra | $2.00 | $1.25 | $1.00 | $0.75 | $0.50 |
| Casing, Floor and Box Nails | .... | 1.50 | 1.25 | 1.00 | .75 |
| Finishing | .... | 1.75 | 1.50 | 1.25 | 1.00 |
| Fine Finishing | .... | 2.00 | 1.75 | 1.50 | 1.25 |

| | Barrel. | Roofing. |
|---|---|---|
| ¾ inch, extra | $3.75 | $3.75 |
| ⅞ inch, extra | 2.75 | 2.75 |
| 1 inch, extra | 2.25 | 2.25 |
| 1⅛ inch, extra | 2.00 | 2.00 |
| 1¼ inch, extra | 1.50 | .... |
| 1⅜ inch, extra | 1.00 | .... |
| 1½ inch, extra | .75 | ... |

| Clinch Nails. | Kegs. | Half kegs. |
|---|---|---|
| 1½ and 1¾ inch, extra | $1.75 | $2.05 |
| 2 and 2¼ inch, extra | 1.50 | 1.80 |
| 2½ and 2¾ inch, extra | 1.25 | 1.55 |
| 3 inch and larger, extra | 1.00 | 1.30 |

## Miscellaneous Prices.

The prices of Augers and Bits are quite regularly maintained and there is not the demoralized condition that a comparatively short time ago characterized the market.

Brass Butts are steady and held pretty uniformly by the manufacturers at the advanced quotations. Some of the wholesale merchants who have large stocks on hand are, however, cutting the price to some extent.

A slight advance has been made in the prices of Heavy Hammers, Sledges, &c., which are now, by most manufacturers, quoted about 5 per cent. higher than they have been. There is no change to be noted in the price of Handled Hammers.

Slight concessions have recently been made by some of the manufacturers of Wrought Butts and Strap and T-Hinges, with a view to meeting the competition of some goods which have been offering at low figures.

A decline of about ¼ cent per pound has taken place in Sisal Rope. Manila Rope is, however, held firmly at former prices. Fine Sisal Lath Yarn is now the same price as the basis price for Sisal Rope, and Coarse and Medium Sisal Lath Yarn is 1 cent per pound below the basis.

The following quotations on the manufactures of the Fulton Iron and Engine Works, Detroit, Mich., will be of interest to the trade:

| | Discount. |
|---|---|
| Cheney's Combined Anvil and Vise | 25 % |
| Stoddard's Lightning Tire Upsetter | 15 % |
| Detroit Iron Shears | 15 % |
| Detroit Perfected Tire Benders | 15 % |
| Rice Hand Punches | 15 % |

The prices of Wringers, as established by the associated manufacturers, are regularly maintained, and this line of goods is referred to as being in an exceptionally satisfactory condition. The list adopted by the manufacturers is subject to an abatement of $3 per dozen, with a discount of 2 per cent. for cash in 10 days, f.o.b at factory. In some markets jobbers who handle these goods are selling them at slight advances on the above prices, but in many cases they are sold at the manufacturers' prices. The high prices that are ruling on rubber, which enters largely into the cost of the Wringers, have the effect of making the market on these goods exceptionally firm, irrespective of the strength given to it by the understanding existing among the manufacturers.

The following revised prices of Planished Copper are announced under date May 5. It will be observed that several changes have been made in the list.

*Planished Copper.*

| | |
|---|---|
| 14 x 48, 14 and 16 oz. and heavier, per pound | 36 ¢ |
| By the case, per pound | 35 ¢ |
| 12 oz. and lighter, per pound | 38 ¢ |
| By the case, per pound | 37 ¢ |
| Boiler sizes. 7 inches, 14 x 52; 8 inches, 14 x 56; 9 inches, 14 x 60, 14 and 16 oz. and heavier, per pound | 36 ¢ |
| By the case, per pound | 35 ¢ |
| (And all sizes not over 20 inches wide). | |
| 24 x 48 and 30 x 60, 14 and 16 oz and heavier, per pound | 39 ¢ |
| 12 oz., per pound | 42 ¢ |
| Planished Brass same price as Planished Copper. | |

The Salem Nail Company, A. Nelson, 295 Pearl street, New York, have issued a circular under date of the 10th, quoting as follows:

*Boat, Ship and Dock Spikes, Black.*

| | |
|---|---|
| ½ in., 8 to 12 in | $2.60 |
| 7-16 in., 7 to 9 in | 2.70 |
| ⅜ in., 5 to 8 in | 2.80 |
| 5-16 in., 4 to 7 in | 2.90 |
| ¼ in., 3 to 6 in | 3.10 |

All per 100 pounds, with an advance of $1 for Galvanized.

Galvanized Cut Nails and Spikes are quoted $3.15 per keg, 10d. base, with the same extras for all sizes and kinds as Black.

Galvanized Swedes Iron Boat Nails are quoted $6 for 2 to 6 inch, $6.50 for 1¼ to 1¾ inch, $7 for 1 and 1½ inch and $7.50 for ¾ and ⅝ inch.

Copper Nails, ½ to 6 inch, are quoted 24 cents per pound, and Copper Tacks, ½ to 2 inch, 25 cents per pound.

The prices of Galvanized Hexagon Wire Netting rule somewhat lower this season than last. The demand for this line is constantly increasing, and it is stated that over 20,000,000 square feet are sold per annum. For the convenience of the trade we append the list of 1 and 2 inch mesh, which is subject to a discount of from 70 and 10 to 75 per cent.:

*One-Inch Mesh.*

| | |
|---|---|
| 1-inch, No. 16 | 14½ cents per square foot |
| 1-inch, No. 17 | 10¾ cents per square foot |
| 1-inch, No. 18 | 8¼ cents per square foot |
| 1-inch, No. 19 | 7 cents per square foot |
| 1-inch, No. 20 | 6 cents per square foot |

*Two-Inch Mesh.*

| | |
|---|---|
| 2-inch, No. 14 | 10 cents per square foot |
| 2-inch, No. 15 | 7 cents per square foot |
| 2-inch, No. 16 | 5 cents per square foot |
| 2-inch, No. 17 | 4 cents per square foot |
| 2-inch, No. 18 | 3 cents per square foot |
| 2-inch, No. 19 | 2½ cents per square foot |
| 2-inch, No. 20 | 2⅝ cents per square foot |

Last season some of this Netting was imported, its price then being higher than it is at present, but at the figures now prevailing the market is left to the American manufacturers, whose prices were reduced to meet the foreign competition.

The following is the price list of the Peters Cartridges for trap and field shooting, manufactured by the Peters Cartridge Company, Cincinnati, Ohio. They are loaded in Star, Rival, Club or Climax shells. In the list, as given below, the favorite trap loads are designated by an asterisk (*). The discount from the list to the trade is 20 and 10 per cent. Terms, f.o.b. Cincinnati, Chicago, New York, Baltimore, St. Louis, Kansas City and St. Paul.

*The "Popular" Cartridge.*

| No. | Dr. Powd'r. | Oz. Shot. | | Price per case. |
|---|---|---|---|---|
| | | 12 Gauge. | | |
| 405 | 2½ | ¾ | No. 10 | $12.50 |
| 409 | 3 | 1 | 10 | |
| 411 | 3 | 1 | 9 | |
| 413 | 3 | 1 | 8 | |
| *421 | 3¼ | 1⅛ | 8 | 13.00 |
| *425 | 3¼ | 1⅛ | 7 | |
| 427 | 3¼ | 1⅛ | 6 | |
| *441 | 3½ | 1⅛ | 8 | |
| *443 | 3½ | 1⅛ | 7 | |
| 445 | 3½ | 1⅛ | 6 | |
| 447 | 3½ | 1⅛ | 4 | |
| 453 | 3½ | 1⅛ | 5 | |
| 467 | 3¾ | 1⅛ | 3 | |
| *449 | 3½ | 1¼ | 8 | 13.25 |
| *451 | 3½ | 1¼ | 7 | |
| 479 | 4 | 1⅛ | BBB | |
| | | 10 Gauge. | | |
| 420 | 3½ | 1⅛ | 9 | 13.75 |
| 422 | 3½ | 1⅛ | 8 | |
| 430 | 3¾ | 1⅛ | 8 | |
| 446 | 4 | 1⅛ | 6 | 14.00 |
| 466 | 4½ | 1⅛ | 5 | |
| 468 | 4½ | 1⅛ | 4 | |
| 470 | 4½ | 1⅛ | 3 | |
| *438 | 4 | 1¼ | 9 | 14.25 |
| *442 | 4 | 1¼ | 8 | |
| *444 | 4 | 1¼ | 7 | |
| *454 | 4¼ | 1¼ | 8 | |
| *458 | 4½ | 1¼ | 8 | |
| *462 | 4½ | 1¼ | 7 | |
| 474 | 5 | 1⅛ | BBB | |

*The "Quick-Shot" Cartridge.*

12 Gauge.

Loaded with the celebrated "Quick Shot" Powder, and extra quality of wadding.

| No. | Dr. Powder. | Oz. Shot. | | Price per case. |
|---|---|---|---|---|
| 505 | 2¼ | ¾ | 10 | |
| 507 | 2¾ | ⅞ | 10 | $13.50 |
| 511 | 3 | 1 | 9 | |
| 513 | 3 | 1 | 8 | |
| *521 | 3¼ | 1⅛ | 8 | |
| *525 | 3¼ | 1⅛ | 7 | 14.00 |
| 527 | 3⅛ | 1⅛ | 6 | |
| 549 | 3⅛ | 1¼ | 4 | |
| *533 | 3¼ | 1¼ | 8 | |
| *551 | 3⅛ | 1¼ | 8 | 14.25 |
| *553 | 3⅛ | 1¼ | 7 | |
| 575 | 4 | 1⅛ | 5 | |

10 Gauge.

| | | | | |
|---|---|---|---|---|
| 522 | 3½ | 1⅛ | No. 9 | |
| 524 | 3½ | 1⅛ | 8 | 15.00 |
| *540 | 3¾ | 1⅛ | 8 | |
| 548 | 3¾ | 1¼ | 10 | |
| *550 | 4 | 1¼ | 8 | 15.50 |
| *552 | 4 | 1¼ | 7 | |
| 558 | 4¼ | 1⅛ | 5 | |
| *554 | 4¼ | 1¼ | 8 | |
| *556 | 4¼ | 1¼ | 7 | |
| *560 | 4¼ | 1¼ | 7 | 15.75 |
| 562 | 4½ | 1½ | 6 | |
| 566 | 4½ | 1⅛ | 4 | |
| *568 | 4½ | 1¼ | 8 | |

*The "Ducking" Cartridge.*

Loaded with extra quality "Ducking" Powder and extra fine wadding.

12 Gauge.

| | | | | |
|---|---|---|---|---|
| 649 | 3½ | 1⅛ | No. 4 | |
| 657 | 3¾ | 1⅛ | 3 | $16.25 |
| 659 | 3¾ | 1⅛ | 1 | |
| 666 | 4½ | 1⅛ | 5 | |
| 668 | 4½ | 4⅛ | 3 | 18.75 |
| 676 | 5 | 1⅛ | 2 | |

Attention is called by the Manufacturers' Association of Brass and Iron Steam, Gas and Water Work to the differential discounts adopted at Pittsburgh April 24th for the Pacific Coast, Denver, Kansas City, Omaha, St. Paul, Minneapolis and tributary points. These special discounts are explained as follows:

*Pacific Coast and Tributary Points.*

All Brass goods quoted or sold for delivery on the Pacific Coast shall be at 1 per cent. gross less than "trade" discounts—*i. e.*, Brass Globe Valves shall be invoiced at 59 and 10 per cent., instead of 60 and 10 per cent.

All Iron work quoted or sold for delivery on the Pacific Coast shall be at 4 per cent. gross less than "trade" discounts—*i. e.*, Iron Safety Valves shall be invoiced at 61 and 10 per cent. instead of 65 and 10 per cent.

*Denver or Tributary Points.*

Discounts on all invoices for Denver or tributary points shall be rendered at 2 per cent. gross less than "trade" discounts, except for Iron work, which shall be invoiced at 5 per cent. less than "trade" discounts.

*St. Paul, Minneapolis, Omaha, Kansas City and Tributary Points.*

Discounts on all invoices of Iron work at these points shall be rendered at 2½ per cent. gross less than "trade" discounts.

*Freight Allowances.*

Actual freight only shall be allowed to San Francisco, Los Angeles, Portland, Ore., Denver, St. Paul, Minneapolis, Omaha and Kansas City, and no freight allowance shall be deducted by giving an additional discount.

Buyers at points tributary to the above cities must pay a freight rate equivalent to the local freight from the nearest or cheapest delivery city.

It is stated that the above rules will be strictly enforced.

## Items.

The Western Arms and Cartridge Company have succeeded D. L. Lamberson & Co., dealers in Firearms and Fishing Tackle, Ammunition, &c., whose headquarters were with Spalding Brothers, at 108 Madison street, Chicago. The new company have taken the storeroom at 49 State street, formerly occupied by Larrabee & North, Hardware merchants, and have purchased the balance of their Hardware stock left from a closing-out sale, which they are disposing of as rapidly as possible. The company's Cartridge factory on the north side of the city was recently burned, and they are now receiving their supplies of Chamberlain Loaded Shells from Cleveland.

G. Irving Abendroth, 28 Cliff street, New York, sends out a circular relating to Chandler's Ice Cutting Machines, of which the list prices for the different sizes are given. A number of hotels are also mentioned as using the Cutter.

By a typographical error the address of John T. Henry, in his advertisement in last week's *Iron Age*, was given as Hampden, instead of Hamden, Conn. On account of this error some letters were incorrectly addressed and failed to reach Mr. Henry promptly. The trade will note the correction, and observe the advertisement on page 59 relating to his line of Pruning Shears.

The Manly Mfg. Co., Dalton, Ga., have issued a catalogue devoted to Railings and Builders' Iron. It represents the following lines: Stairs, Shutters, Doors, Guards, Crestings, Stable and Office Fittings, Gates, Fences, Settees, Lawn Furniture, &c. The pamphlet is fully illustrated and will be found of interest.

Keene Bros., 167 South Clark street, Chicago, issue a catalogue in which they show a variety of the leading Tools which they sell, on which net prices are quoted. They also send out a circular relating to Hand Screws and Cabinet Clamps of the Grand Rapids Hand Screw Company, for whom they have been appointed Western agents.

The Coupon Introduction Company, 39 and 41 Cortlandt street, New York, issue a pamphlet entitled "The Introducer," in which they illustrate the lines of goods which they are putting on the market. It relates to a number of interesting specialties, including Fuel Cartridges, Type Writers, Safety Razors, Signal Sad Irons, &c.

A pamphlet devoted to an exhibition of the business advantages of Carthage and Jasper County, Mo., gives an illustration of the handsome Hardware block of McCrillis Bros., while at the same time it exhibits in effective style the attractions and growing importance of the city.

Our readers will observe among the Special Notices one on page 50, in which the receivers of the North Carolina Millstone Company, Raleigh, N. C., announce that on July 5 they will sell at auction the assets of the North Carolina Millstone Company, formerly doing business at Parkewood, including large tracts of timbered and farming lands, as well as the quarry, shops, machinery, &c., of the company. In a circular relating to this property information is given in regard to the quality of the Stone, its special adaptedness for mill use, the extent and value of the land, with details in regard to the shops, machinery, dwelling houses, &c., which are also offered for sale.

In one of our exchanges we find a description of the Hardware establishment of John T. Starr, Coldwater, Mich. The store consists of three stories and a basement, which are referred to as utilized to the best advantage, an elevator connecting the different floors. The completeness and variety of the stock are indicated in the article, as well as the convenience of the arrangements of the store.

C. E. Hudson, the well-known manufacturer of Apple Parers, Leominster, Mass., is about to put on the market, in addition to his regular line, a new Apple Parer, which is designed to meet the competition of cheap Parers.

The notice of our readers is directed to the change in the management of the Morrill Saw Set business, as will be seen by reference to the advertisement on page 68. The appointment of a receiver is not occasioned by any financial difficulties, but merely to conserve the interest of all parties pending the litigation which is to determine the rights of the Farr estate.

McIntosh, Huntington & Co., Cleveland, Ohio, send out a postal calling attention to their stock of Hay King, Chieftain, Keystone, Philadelphia and Continental High-Wheel Lawn Mowers, intimating that orders are filled the same day as received.

The United Brass Company, owners of the properties leased by the Haydenville Mfg. Company, Haydenville, Mass., and the Loraine Mfg. Company, Loraine, Ohio, have retired from the commission business. Hereafter the Haydenville Mfg. Company, with New York office at the corner of Fulton and Gold streets, will sell direct to the trade, besides acting as agents for the specialties made by the Loraine Mfg. Company. The latter company will also sell their own goods direct.

Peabody & Parks, Troy, N. Y., will hereafter manufacture the Farmers' Favorite Potato Bug Exterminator—Eddy's patent. This article has been already largely introduced and is widely known, and the above firm are prepared to fill orders promply.

The trade will observe the new uses to which Indurated Fibre Ware is being put, as explained in the advertisement on page 52 of the Union Indurated Fibre Company.

## Fire at the Disston Works.

A serious fire occurred at Tacony, a suburb of Philadelphia, early on Sunday morning, in which the Steel works and Sheet rolling mill of Henry Disston & Sons' Saw and Tool Works were entirely destroyed. The burned building was of brick, one story high, and covered a superficial area of 180 x 380 feet. The fire broke out shortly after 2 a. m., and three engines were soon at work, but the flames made rapid headway and the firemen found it impossible to save the rolling mill. They therefore bent their efforts toward preventing the destruction of the other buildings composing the works. These were eight in number, and consisted of the bar mills, gas works, offices, laboratory and storehouses. These were all to the southwest of the burning building, and the wind was blowing strong from the northeast. The new rod mill, which is built completely of iron, was on the north of the rolling mill, and was not damaged. The other buildings were imperiled, owing to the direction of the wind, and the fact that their roofs were covered with sparks and blazing pieces of timber. These were extinguished by the five streams of water that were furnished by the three engines, and the salvation of the other buildings was accomplished.

The destroyed mill was one of the finest of the kind in the country. It was filled with the most improved machinery, all of which was damaged and most of it destroyed. The machinery will be practically a total loss. There were five immense fly-wheels, all of which were badly cracked, and the large cast-iron engine beds were warped and broken. In the building were six Hazleton boilers, four sets of rolling mills, 13 heating furnaces, two sets of gas fires and three sets of coal fires. There is some doubt as to the exact origin of the fire. About 250 hands out of 1600 are thrown out of employment by the fire. The mill will be rebuilt immediately, and it is intimated that it will be of corrugated iron and absolutely fireproof. The loss amounts to about $300,000, upon which there is an insurance of $190,000. Most of this was placed with the Manufacturers' and Mutual Fire Insur-

ance Company of Boston, and the rest with a local company.

The trade will be gratified to learn that the fire will not interfere with the prompt execution of orders. Only one of the two mills from which the firm draw their supply of Steel for the manufacture of Saws was destroyed, and as they have one mill still to rely on, and were fortunately caught with a large stock of material on hand, they feel justified in announcing, as per Special Notice on page 53, that all orders will be filled with their customary promptness. It will be observed that at the same time they state that they will be pleased to send, on application, a copy of their valuable pamphlet, "The Saw, How to Choose It and How to Keep It in Order," an intimation that their business will continue without serious interruption.

## Trade Topics.

A subscriber in Colorado writes as follows concerning a matter to which we have heretofore called the attention of the trade:

If you can induce the manufacturers of Carriage Bolts to turn on the nuts far enough so that they won't part company with the Bolt before they get into the retailer's hands, you will save enough to the smallest retailer to pay for *The Iron Age* for a year, and a box of cigars at Christmas.

In regard to the removal of the warranty on Cross-Cut Saws, C. P. Adams & Son, Randolph, N. Y. write as follows:

We have read with interest the letters published by you lately bearing on the warranty on Saws. We say take the warranty entirely off, and especially on Cross-Cut Saws. There will be as many sold and with more satisfaction to all concerned. Last fall and winter we did not warrant a single Saw, and our sales were never so large.

## Freight Classification.

The representatives of Western railroads held a meeting recently to revise the Western freight classification, but the result of their labors is not satisfactory to the Hardware trade. Instead of putting heavy and low-priced goods in lower classes, the revision advances the classification on some goods of that character. An instance of this is found in Hinges in boxes. They have been advanced to second class, instead of being put in the fourth or fifth class, in which they properly belong. Ordinary Iron Hinges are heavy, very low priced and so strong that they are not often damaged in handling, and yet they are made to pay a very high rate of freight. The difference in cost between them and fine Bronze, Nickel or Silver Plated Hinges is very great, but all these goods, if packed in boxes, are charged with the same rate of freight. The Western Hardware jobbers are deeply interested in this question and will continue to agitate it until they secure a more equitable adjustment of rates.

## Obituary.

At a meeting of citizens held in Columbus, Ohio, April 14, for the purpose of taking appropriate action on the death of Peter Hayden, to which we have before referred, the following memorial was presented by Mr. Noble. It will be of interest as giving an account of the long and prosperous career of one of the leading American manufacturers, while at the same time it refers appropriately to the esteem in which he was held:

Peter Hayden, who died in New York City on the evening of April 6, 1888—the last day of the century of the settlement of Ohio—having lived more than four-fifths of that period, and having for nearly 53 years been engaged in building up the manufacturing and industrial interests of this part of Ohio, deserves for his large usefulness and marked individuality of character a memorial tribute from the citizens of Columbus.

Mr. Hayden was born in Oneida County, New York, September 15, 1806, while his father was a lay missionary to the Oneida Indians, but was brought up in Cummington, Mass. He belonged to a family of inventors, and gave evidence early in life of his predelictions to mechanical pursuits.

About 1828 or 1830 Mr. Hayden, in connection with his brother, Cotton Hayden, commenced the manufacture of hames and saddletrees at Auburn, N. Y. But a few hands were employed at the start, and the junior partner, Peter, worked with his own hands. At times, as stock accumulated, he would load up a sleigh with their goods and sell them through Central and Northern New York and Canada. The brothers started a saddlery hardware store in connection with their shop, principally to handle English imported goods with their own. In 1834 Cotton Hayden died. The Auburn establishment is still in existence, and is conducted by Mr. Arthur Boyd, a son-in-law of Peter Hayden. In 1835 Mr. Hayden came to Columbus, and after examining the heavily wooded country in this vicinity, entered into a contract with the State of Ohio on the 10th of June, 1835, "for the employment of from 50 to 100 convicts for five years in saddle-tree and hame making and in plating and the manufacture of saddlery and harness trimmings generally."

From this beginning has grown up the large manufacturing, mining, mercantile and banking interests of Mr. Hayden, which have done so much for the growth and prosperity of this city and the Hocking Valley. Mr. Hayden was pre-eminently qualified for manufacturing. His great mechanical skill and ingenuity enabled him readily to determine the best means for accomplishing results. He had indefatigable industry and perseverance and that ready willingness to take hold of any branch of his business and by a personal effort bring it to a successful issue. He was but 29 years of age when he removed to Columbus.

As his business increased he extended it into other departments and beyond the prison walls, and ultimately he opened, in connection with various parties, mercantile houses for the sale of his manufactures in Cincinnati, St. Louis, Chicago, Detroit, Galveston and San Francisco, while he retained his interest in the business in Auburn. When the war against the Union broke out his entire property and assets in Galveston were confiscated, and large accounts belonging to the Cincinnati business throughout the South were lost. With ready ingenuity, however, Mr. Hayden turned his machines used for the manufacture of buckles to the manufacture of bullets, and made artillery harness and cavalry equipments for the United States Government. Upon the revival of trade during the war his business revived, and soon gained more than had been lost. Mr. Hayden for many years owned a large mineral tract in the Hocking Valley, at what is now Haydenville, from which coal was brought to his factories here by canal-boats. When the Hocking Valley Railroad Company was organized he became its first president. Since then his industries at Haydenville have greatly increased, including many products manufactured from fire-clay, so that about 200 men are employed there. His various manufactories in Columbus employ about 400 men outside of the penitentiary.

In 1852 Mr. Hayden removed to New York, but he left his interests here in the hands of his partner, Mr. Baker, and his two sons and his many competent agents and foremen, to be carried on under his general direction and his frequent personal supervision. In New York he was a director of the Park Bank; and in 1866 he established the banking house of Hayden, Hutcheson & Co. in this city, in connection with the late Joseph Hutcheson, which in 1871 became P. Hayden & Co.

Mr. Hayden was an excellent judge of men, and secured the services of trustworthy and competent agents and foremen for his varied interests. This was largely, no doubt, a gift, but it was also the result of careful watchfulness of the conduct and character of those he employed. He was pre-eminently just in his dealings with all he employed, sympathizing with the unfortunate and helping the distressed. He was a man of integrity and high sense of commercial honor. The result was that his laborers were content and his business was free from contention and litigation. With his friends and acquaintances he was genial and kindly and sought relaxation from business in humor, but was free from depreciating criticisms of his neighbors and from meddling with their affairs. He was a man of sturdy frame, strong muscles, and fine constitution, which carried him beyond his four score years.

Mr. Hayden was never connected with public life except a short time when he served as a trustee of the Institution for the Deaf and Dumb. His own business was so extensive that he had no time for public employment, nor did he seem to have any taste for conspicuous position or display. His mode of living was unostentatious, his disposition retiring, and his manner simple and unassuming. In all the relations of life he was justly esteemed, and his many friends will mourn his loss, while his useful and untarnished life will remain a lesson to the rising generation.

In view of his character and his labors for the upbuilding of our city, be it

*Resolved*, That we, his fellow-citizens, regret the loss of Mr. Peter Hayden, though he had reached a ripe old age; and we will honor his memory and his life by recalling his many virtues and his valuable labors among us.

*Resolved*, That, as an expression of our sympathy, we will present this memorial and these resolutions to his widow and family through our president and secretary.

The death of Isaac Utter, president of the Utter Mfg. Company, director of the Rockford Tack Company, member of the firm of Rhodes, Utter & Co. and director of the People's Bank and the Rockford Watch Company, at Rockford, Ill., is announced. Mr. Utter was a native of Eaton, N. Y., and is refereed to as held in high estimation.

John B. Dash, at one time a member of the Hardware firm of Wolfe, Dash & Fisher, of this city, died on Friday last, at the age of 70. He had not been connected with the Hardware trade for many years.

## Condition of Trade.

We continue in the following columns the publication of advices received from Hardware merchants throughout the country, giving information in regard to the feeling in business circles, extent of building operations, prospect for crops and other matters bearing upon the probable course of business during the coming months. Before giving this information, classified according to locality, we take pleasure in laying before our readers the following extract from a letter just received from a Hardware merchant in Illinois, whose careful review of the situation is entitled to especial weight:

We have had lately throughout this section of the West copious falls of rain very much needed, which have greatly improved our prospects. While we do not yet see any marked improvement in trade, which is only reasonably satisfactory, the outlook is encouraging for large crops, which will bear good results. Spring trade has not been, as a whole, what was expected, although the jobbers throughout the West report heavy sales during February and March. This was probably due to the low rates of freight existing. Hence merchants taking advantage overstocked, and then sales not being as large as anticipated entailed slow collections, and this is now the general complaint. Collections are, therefore, very difficult, although I do not think there is any stringency in the money market. Banks are generally easy, and have money. There seems to be very little activity in the Iron market. A year ago in February, as I understand, the mills bought heavily, employing all available vessels in transporting Iron to Western ports. This compelled a charge of 8 cents freight per bushel on grain. This year grain was transported at 2 cents per bushel.

Last year, however, was an exceptional one, and was marked by the greatest railroad mileage in the history of this country. In the fall of 1887, in my opinion, we came nearer to a panic in the money market than at any time for several years back, and had it not been for the large reserves of our metropolitan banks, backed by the Government, we would have seen some terrible collapses. The strikes have greatly retarded building this year, but they are being generally settled, and the prospects are much brighter. Labor organizations, or, as I term them, "The Blights of Labor," have done more to demoralize trade the past few years without deriving any benefit than all the other trusts or politics combined. This being Presidential year, it is always considered a poor year for business. The issues, it seems to me, are more commercial than political this year, bearing upon the tariff and kindred questions difficult to decide, but momentous as affecting the prosperity of the country. Summing up the situation, with prospects favorable from the present outlook, I would advise a cautious, conservative method for the balance of the year.

IOWA.

*Marshalltown.*—General business is very fair; collections less than average. Stocks of Hardware are not full, excepting staple articles, a great many of which were bought because transportation was cheap during the Western rate war. There will be some building done—not beyond actual needs, but such as is required for a healthy growth. The outlook for Central Iowa is better than it has been for five years past. Western emigration, including the exodus to the Pacific Coast and Southern California, is reacting. One or two good crops will be all that is necessary to vitalize the people and their business. Iowa, with her dark, deep soil and pleasant people, surrounded by growing cities and metropolitan communities, is assured prosperity. It may not be rapid, but it will be certain.

TEXAS.

*San Antonio.*—Trade is very quiet, but the outlook is better than we have had for three years. Hardware stocks are large in this city, but the country merchants' stocks are light, to a certain extent, as they have been cautious, and we have been trying to sell only small amounts of goods. We have not been pushing trade, as there is very little money on the frontier. If the season keeps up as it is now, with about two rains in May, we will make good crops.

*Taylor.*—Trade with us this spring has been satisfactory, and the prospects are that it will continue so until after harvest. Small grain, wheat and oats look very well and promise a good yield. All other crops are in good condition. Prospects have never been better for cotton and corn crops. We think stocks of Hardware in our section are not large, but, on the contrary, are light. Owing to depression in business last year goods that would have been sold in an ordinary year were carried over and sold this spring. If cotton continues to show up well merchants will feel like buying some goods for fall and winter trade. We have no doubt that business next fall will be very good if good crops are made, on which, of course, everything hinges. In our town building has been very active this spring, and is still going on at the same rate.

*Houston.*—Hardware stocks, as far as we know, are rather small in hands of jobbers here, and also reduced in the country, as we are not trying at present to place many goods with trade tributary to our city. Nails are an exception, as all jobbers who could do so took advantage of cut rates by ocean lines last month and accumulated large stocks, like we did ourselves. Prospects for building this season in this city are very fine, a great many contracts having been let. Collections are only fair, and the condition of trade in general we consider quite good.

*Weatherford.*—Stocks of Hardware are not large, dealers not buying more than immediate needs demand. Building will increase as the season advances. I cannot say that collections have been bad, as credit has not been extended to any great extent. Wheat, oats and corn crops promise a good yield, especially wheat and oats, which are now well advanced. Cotton is now being planted, and the land is in good condition to receive it. This section has a better outlook than for two years past.

*Dublin.*—So far as we know, Hardware stocks are small, with tendency to further decrease; money scarce. Collections comparatively out of the question. With splendid season to date and the finest prospects for all kinds of crops the country has had for years, the general feeling in regard to business may be said to be buoyant; but the lessons of the past two years' failure in crops have brought about quite a conservative feeling on the part of merchants as to making anything like large purchases or advances even in the face of flattering prospects, and business will be generally conducted upon a hand-to-mouth policy till late summer.

*Dallas.*—Trade at the present time is extremely dull, and will be until after harvest, and cotton comes into market. There is comparatively little money in circulation in this section of the country from March 1 to October 1, The consequence is the bulk of merchandise sold in these intermediate months is sold on credit, full time given. Conservative dealers are not pushing sales on account of this, and their wants are few and will be until July, at which time the crop prospects can somewhat be calculated upon. At the present time the outlook is very encouraging. Crops all planted and growing rapidly and in fair condition in every respect. Acreage of corn and cotton larger than ever before. On the whole the prospects for the coming season are very good.

*Waco.*—All the conditions and circumstances tend to a prosperous trade the coming season throughout Central Texas. We have had ample winter and spring rains, a fact which has given the farmer new life with renewed energy, the indications being that we will have as large a crop, and perhaps larger, than we had in 1882, which was the largest crop year that ever blessed this part of the State. Stocks of Hardware are generally very light, and if the present good conditions continue until the middle of July or first of August we shall have an early trade, which will continue active and brisk throughout the fall and winter months. Collections are very dull, and will necessarily continue so until the cotton crop is made and put on the market. We note some improvement in building, and look for an increase of business in this line as the season advances.

*Ballinger.*—Trade in the Hardware line is quiet just now, though the outlook for the coming season is good. Collections are rather good. Stocks of Hardware are about as usual. We are having plenty of rain, and grain prospects are very flattering. There will be considerable public building going on in this city this year.

*New Braunfels.*—In this part of the State trade is dull, on account of the failure in crops for the last two seasons and the low prices, together with the fact that farmers have been unable to sell stock, which has thus accumulated. The outlook for a crop is excellent at present, and corn and cotton look fine. Stocks of Hardware are larger than the trade need. We will need two crops to make all collections, as farmers are heavily indebted. There is very little prospect for building, as it will take a good crop to clear the farmers up.

*Calvert.*—Trade with us is very dull, owing to the shortness of crops last season. Collections are slow, and we expect them to continue so until another harvest. Our present prospects are good for a crop, and the general feeling is that we will make a good crop this year and accordingly expect business to be good later in the season. Stocks of Hardware very full and only actual wants will be bought until August. We are expecting some building during the summer, as our town is just now looking up on account of opening of coal mines near us.

MINNESOTA.

*Waterville.*—The state of general business in this section is good, but collections are very slow. Stocks of Hardware are large, and the prospects for building especially bright. The general feeling in regard to the outlook is good. The spring has been late, but prospects for a good crop are good. There is a large amount of winter wheat in this section, and prospect for a large crop was never more promising. We think the outlook in this section at present is for a prosperous season.

*Willmar.*—The general business of this section is in fair condition, despite a hard winter and delayed springtime. Collections are not good, but this results from causes which will correct themselves with the advent of warmer weather. Stocks of Hardware are usually full, some dealers having taken advantage of exceptionally low freights to get in goods in advance of immediate wants, and even for summer sale. Large building operations are not anticipated, but a great many extensions and improvements are in progress and contemplated. While trade is not large, a hopeful feeling prevails in regard to the immediate future. Seeding is now in progress under conditions of soil considered favorable for a good harvest. Stock is in large supply, but prices are low. Any advance would be of great benefit to our farmers and business generally.

*Lake City.*—We suffered a very large loss in trade, owing to the chinch bug destroying the crop, making it almost a total failure in this section. The prospect for building is very poor. Stocks of Hardware are full. We find it very difficult to make collections and we think trade will be very light until the prospect of the next crop is ascertained.

*Spring Valley.*—We are having a very late, cold, wet spring, but the farmer does not complain, for he says it is just what is needed to destroy chinch bugs and soak the ground after the past two years' drought. Trade and collections are very dull and probably will be until fall.

*St. Cloud* —During the winter months business was very light, on account of deep snow and severe cold weather. In the latter part of March trade improved and has ever since steadily increased. Spring trade has been, so far, a little above the average. Collections from the country are poor, but are fair in the city. Prospects for building and general improvement are excellent, for, according to the amount of contracts already closed, St. Cloud will have a very busy building season and a good, healthy and substantial boom. The outlook for country trade is getting brighter. Stocks of Hardware are about as large as usual at this time of the year.

ALABAMA.

*Greenville.*—We depend on cotton and corn crops for good sales of Hardware. We have in this section a fine stand of cotton and corn and a good prospect. Seasons permitting we will have over the

average. Our trade at present is dull. Stocks at present are light. Goods sold are principally Plows and Plow Gear. Collections have been fair this season.

*Birmingham.*—The condition of trade and the outlook for the coming season are quite satisfactory in this section. There has been a marked improvement in collections for the past 90 days over the preceding three months. Stocks of Hardware are large for the season, the amount of Nails on hand being especially large. With regard to the prospect for building it can be said that while there will be a great deal of it in this city and in what is now called the "Birmingham district," yet it is not thought the amount for this season will equal that of last season.

GEORGIA.

*Columbus.*—At this season of the year we are winding up our spring business, which, we may say, has been very good indeed. Our building season is now opening and promises to be much larger than for years, no doubt owing to capital seeking new investments and citizens homes in the South. Our city is especially looking up. We are quite sure collections will compare very favorably with other years. It is quite hard indeed to say anything just at present as to the outlook for business, except building, as the crops are not far enough advanced to form any idea as to what may result from them.

ARKANSAS.

*Helena.*—We think stocks of Hardware in this section are larger than last year at same date. The people are requiring larger stocks every year. Collections are very good, but still fall off very rapidly as the summer advances. More good buildings are in progress and contemplated than we have ever known here. All fears of an overflow are gone. Weather very cool and dry. Crops growing very slow. We look for a good average trade.

*Camden.*—As to the state of general business, while it has not this season been as voluminous as was expected, still it has been a good average, and satisfactory to the majority. Collections have been remarkably good, though the long yearly trust system, so long in vogue in this country, is very much on the wane, both to the satisfaction of merchant and customer. There is a growing disposition on the part of our populace to be more cautious in regard to going in debt, and financial honor is on an upward grade in this section. There is no great prospect for building in this section, though there is more than usual. The general feeling in regard to the outlook is splendid.

INDIANA.

*Indianapolis.*—Trade with us is very fair, but the outlook is not promising. The drought of last fall and the unfavorable prospects for a wheat crop are affecting trade, and collections are only fair. Locally the prospects for building were never better, but this does not benefit us much, as our trade extends over a large territory. We expect to do as large a business as ever, but it will require a greater effort.

MISSISSIPPI.

*Macon.*—We have had good business this season, but it has been falling off for the last three or four weeks. Collections were good last fall. Good stocks of Hardware and everything looks bright.

*Yazoo City.*—Trade is very fair for this part of the year, when all the planters are busy in the fields. Trade prospects are good, and there will be more than the usual amount of building in this section. Hardware stocks are large and collections good. We have had very few failures in this section, and our people seem to have all the confidence needed to make business go.

VIRGINIA.

*Danville.*—The prominent agricultural industry in this section is tobacco. The crop has been rather poor for several years, causing a depression in most commercial lines. But the crop of last year, now being marketed, was decidedly better, and merchants generally are enjoying a decided improvement in trade. The farmers are giving more attention to cereal crops, which causes a steady improvement in the demand for agricultural implements. Hardware merchants are keeping their stocks rather fuller than usual, with a feeling of confidence that a good average business year is upon them. Building material is in fair demand, with good prospects for improvement in it as the season advances. Collections are decidedly better than last year. Money is easy, though fairly active, with rates low enough.

MICHIGAN.

*Ishpeming.*—The present outlook for business in this section is not as good as last year by any means. The tariff agitation, railroad and coke strikes all bear heavily on the district, as the industry is iron ore. The tariff especially is causing the mines to work very conservatively. They buy only what is absolutely needed to keep running from month to month. We think the outlook not bright for this season.

*Reed City.*—The outlook for trade in 1888 is above the average, our crops last season being good and prices fair. With a favorable winter for our lumbermen and plenty of snow to protect wheat and grass we have more than ordinary assurance of good crops this season. The most profitable article of produce last season was potatoes. The crop was fair, and generally the farmers buried them and now are selling at 75 and 80 cents per buhsel. Collections are easy. Stocks have been rather light, though our merchants have been buying rather freely this spring, so that at this writing stocks generally are well sorted up. The prospects for building through the country especially are better than for several years past. On the whole, our country is in a prosperous condition.

*Big Rapids.*—We are carrying this spring a stock somewhat larger than usual, expecting a fair trade, particularly from the farmers, mills, &c. So far this season collections and trade are satisfactory. As for the balance of year we cannot tell how much trade will be affected by political excitement. Our prospects are good for fair trade.

NORTH CAROLINA.

*Tarboro.*—The general state of business in our immediate section is not very satisfactory just at present, owing to three successive bad crop years, though the prospect for building manufactories seems to be better than for some time past. Stocks of Hardware are light and collections are not prompt, owing to short crops. The trade seem to be very conservative and buy mostly from hand to mouth, hoping for the good time coming which one good cotton crop would bring.

*Monroe.* — Hardwaremen generally throughout this part of the State have enjoyed a better spring trade than ever before, and the prospect is very bright for a good demand, especially for Builders' Hardware.

*Newbern.* —Owing to various causes, business is not so large this spring as usual. There is quite a movement in the Lumber business of this section and a number of new mills are being erected, giving employment to a large number of people. The usual stocks of Hardware are being carried, and collections about as usual. The great bulk of payments are made from cotton in November, however.

## The Mining Engineers' Meeting.

(*By Telegraph.*)

BIRMINGHAM, ALA., May 15, 1888.

Our Birmingham correspondent telegraphs: The spring meeting of the American Institute of Mining Engineers was opened at O'Brien's Opera House at 8 o'clock this morning by addresses of welcome from Messrs. E. T. Taliaferro and J. E. Webb, of the Birmingham bar, Mr. Webb speaking for the Chamber of Commerce. President W. P. Potter, from St. Louis, and Secretary R. W. Raymond, of New York, responded gracefully for the Institute. Professor Potter said, the Institute had gone from Pennsylvania to Montana, but nowhere had such a happy combination and lavish quantity of mineral wealth been granted as to Birmingham. The speaker was here six years ago, and the transformation since realized the fairy story of Aladdin and his Lamp. Several papers having been read, the Institute at 10 o'clock adjourned for an excursion to Bessemer, which consumed almost the whole afternoon. To-night's session was devoted to the hearing of papers also. The most notable contributions to the literature of the Institute were the papers of Mr. W. M. Bowron, manager of the South Pittsburg Division of the Tennessee Coal, Iron and Railroad Company, and Mr. Alfred W. Brainard, of this city. Mr. Bowron showed by a closely itemized statement, allowing 3 per cent. for repairs and 6 per cent. for interest, that iron could reliably be made in the Birmingham district at $9.04 a ton. Mr. Brainard told the story of the satisfactory manufacture of steel in Birmingham by Henderson's dephosphorizing process. An animated discussion followed, at the close of which it was resolved that the Institute Committee visit the Henderson works to-morrow. Wednesday will be given up to excursions to the mines. There will be another business meeting Thursday.

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The fourth annual meeting of the Philadelphia (Westinghouse) Natural Gas Company was held at Pittsburgh on Tuesday, the 8th inst., and was largely attended. The financial statement for March 31, 1888, showed the total assets to be $9,668,189.49, on which there exists an indebtedness of $1,176,157.73, the sum of $992,031.76 in excess of capital and debt having been paid out of the earnings. The earnings for the past year amounted to $1,709,-702.74; the operating expenses, rents, interest and taxes were equal to 46.65 per cent. of earnings. Dividends at the rate of 1 per cent. have been paid monthly, amounting to $842,626.50, leaving an undistributed surplus for the year of $172,-015.56. The company are supplying gas to 791 manufactories and 22,926 dwellings. The present board of managers were re-elected.

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The Union Indurated Fibre Company, of New York, are meeting with gratifying success in the electrical line. Their battery cells are rapidly being recognized as both good, and cheap. The cars for the Fourth avenue line, which are to be run under the Julien system, are being fitted with these cells. They have also received orders from the Electrical Accumulator Company. Their latest offering of pipe for subway conduit bids fair also to meet the existing requirements. The material has been found an excellent non-conductor and insulator. Tests are now being made by the Pennsylvania Railroad. Their line of Fiberite pails for handling acids and battery solutions are proving very satisfactory. The Western Union Telegraph Company have been using these pails in their battery room in New York with highly satisfactory results.

## Forsyth's Scale Company's New Scales.

The accompanying illustrations represent improved scales which have recently been put on the market by the Forsyth Scale Company, Youngstown, Ohio. Fig. 1 represents the principal details of construction, Fig. 2 a portable scale to which these principles are applied, and Fig. 3 a counter scale with a new design of bracket or beam holder, in which the same principles are also applied. The new feature in these scales consists in casting in a rocking foot or chill, so that the points of the pivots or knife edges C D, Fig. 1, rest against the friction guard at the back of feet A B, thus holding the platform of the scale in position over or on the levers. The advantage of this construction is referred to as being that it does away with all check chains, balls and other appliances for holding the platform in position, while, at the same time, it dispenses with a good many parts used in the old style of scales, thus simplifying the scale and reducing friction to the lowest point. For pivots or knife edges the company state that they use Hobson's choice, best English steel, and spare nothing in the construction of the scales to make them of the best quality. Their capacity for manufacturing is referred to as very large, and with natural gas as a fuel they are confident that they will be able advantageously to serve the trade.

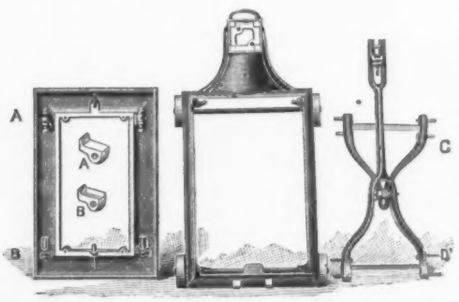



*Fig. 1.—Parts of Scale.*




*Fig. 2.—Forsyth's Standard Portable Scale.*

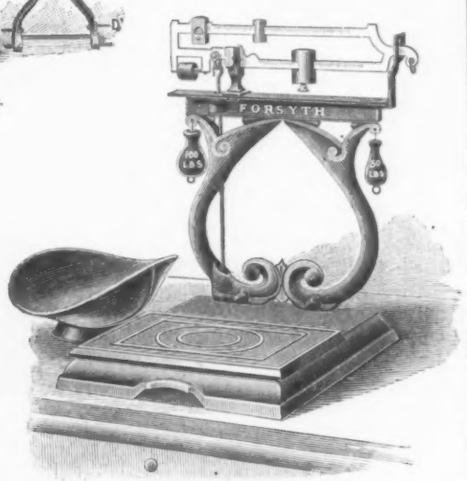



*Fig. 3.—Forsyth's Standard Counter Scale.*

## The Buffer Ice Pick.

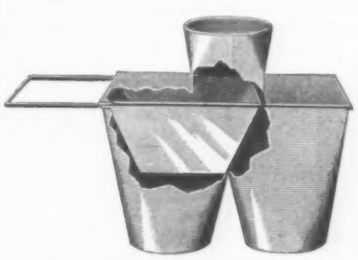
This article is satisfactorily represented in the accompanying cut. It is manufactured by Blanchard, Parker & Co., 71 and 73 North street, Boston. Its special feature is indicated in the name, the ice pick having an india-rubber buffer near the point, and connected with the handle by a spiral spring, through which the pick freely operates. In use the buffer is described as striking the ice simultaneously with the point of the pick, holding the detached particles in place, and not interfering with the operation of cleaving the ice. This construction is referred to as preventing the chips of ice from flying into the face, or up the sleeve. The pick can also be used holding the buffer in contact with the ice with one hand, while it is operated with the other, thus at the same time enabling the person using it to strike at precisely the same point with each succeeding blow.



*The Buffer Ice Pick.*

## Schultz's Rain-Water Cut-Off.

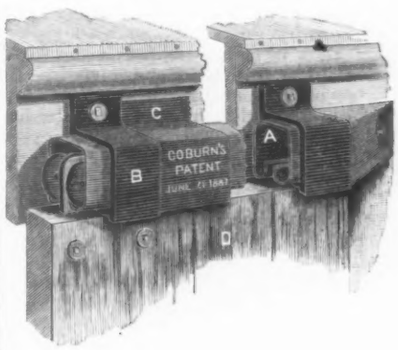
A rain-water cut-off having the merit of extreme simplicity and apparently of very durable construction is being put upon the market by W. W. Alexander, Richmond, Ind. The illustration presented herewith shows the main features of the cut-off and its method of operation. It will be noticed that the slide is hoppershaped, the ends being slanted consider-ably. By this construction the water is thrown into either pipe as may be desired, by simply pushing in or pulling out the handle attached to the slide. The device is not automatic in its operation, and must be moved whenever it is desired to shut off the water from either the cistern or waste as the case may be. It will be noticed further that by moving the slide part of the distance, the water may be admitted partially into each of the lower pipes. The cut-off is substantially made and is self-sustaining in any position. Among the special advantages referred to by the manufacturer are that it requires no lever, spring or catch to hold it when set; that it will not burst in freezing, nor get out of order, and, furthermore, is simple, cheap and durable. The cut-off is made in regular sizes.



*Schultz's Rain-Water Cut-Off.*

## The Coburn Door Hanger.

This hanger, which is represented in the accompanying illustration, is manufactured by the Coburn Trolley-Track Mfg. Company, Holyoke, Mass., for whom Page, Newell & Co. are general sales agents, 139 Milk street, Boston, and 16 Dey street, New York. The special features of this hanger are shown in the cut which represents it applied to a car door. The track A is especially referred to as possessing new and distinctive features, and is made in a drop press from a single piece of sheet steel, and when taken from the press is described as being absolutely true and straight, and from its peculiar form possessing great strength and stiffness. The wheels or rollers are made of cast iron in pairs, with an ordinary steel pin for a center. These wheels roll on their periphery in the grooves of the track, while the center pin rolls on the wrought-iron hanger which is attached to the door. The track is held in position by the brackets B, and the brackets are secured by lag screws or bolts. The steel shield held in position by these same lag screws or bolts covers the entire track and laps over the top of the door, thereby rendering it, it is claimed, storm and dirt proof. While the circular relating to this hanger represents it as applied to freight car doors, it is referred to as serviceable as well for all sliding doors.




*The Coburn Door Hanger.*

The Board of Supervising Inspectors of Steam Vessels, at a special session just closed in Washington City, approved the following devices: The Davis renewable safety fusible plug; the Dobbins metallic life-boat; the Chambers life-raft; the Copeland boiler for using petroleum as fuel; water tube or sectional boilers, presented by James B. Stead, Nos. 1 and 3; water tube or sectional boilers, presented by J. W. Walters. The following named apparatus was disproved: Boiler, presented by Rochester Machine Tool Works; water tube or sectional boiler, presented by J. B. Stead, No. 2; the Berthon collapsible lifeboat; the Lawson non-explosive boiler; John McAdam & Son's marine brake.

The plans adopted by the engineers for the steel bridge, at Memphis, combine the truss and cantilever systems, with a central span not less than 700 feet in length, and the cost will be about $2,000,000.

The iron bridge across the Rio Grande at Laredo for the Mexican National Railway will be completed before September 20.

## Surface Ornamenting Machine.

A surface ornamenting machine, with radial arbor, is being put upon the market by J. A. Fay & Co., of Cincinnati. The machine is designed for producing all kinds of surface ornamentation in a quick and rapid manner. As will be noticed by reference to Fig. 1 of the engravings, the frame is made in a single piece of columnar form with a projecting neck, which has on its extreme end an opening in which is fitted a cylindrical sleeve bearing, which carries the carving spindle. By unloosening the thumb-screws on top the arbor can be radially moved in any direction. The driving pulley is placed on the arbor in the center of the sleeve bearing, and is belted directly on the countershaft placed above. As furnished by the manufacturers it is supplied with one long carving spindle with six cutters; also with four tracing tools. The cutter will be understood by reference to Fig. 2, where the tracing tools are also shown. In Fig. 3 are shown samples of the work produced by this machine, and almost any kind of surface ornamenting can be done with the aid of this device. The cylindrical sleeves can be changed to work upon the opposite side, or the machine can be suspended from above on a frame.

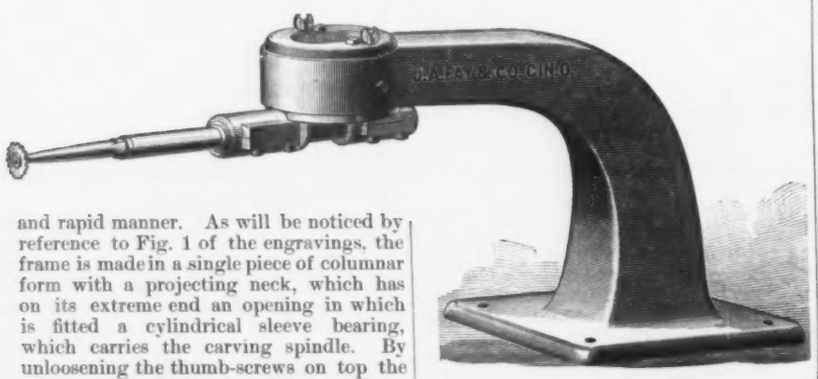



*Fig. 1.—Surface Ornamenting Machine, Built by J. A. Fay & Co., Cincinnati.*

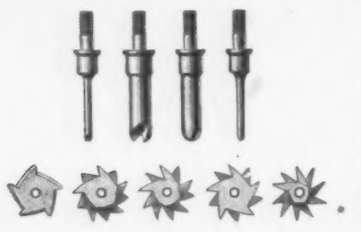


*Fig. 2.—Cutters and Tracing Tools.*

The electric lights on the Brooklyn Bridge, like those lately removed from Hell Gate, have proved to be a serious embarrassment to navigation. Pilots, masters and owners of vessels complain of the dazzling and blinding effect of these illuminations. Major Heap, U. S. A., engineer of the Third Lighthouse District, recommends the use of ground or opal glass globes in the lamps, or using globes of colored glass, preferably of some shade of yellow. Lieutenant Willis recommends the application of reflectors to the lamps. "These reflectors," he says, "could be so adjusted as to intercept all lights now radiated in a direction at right angles to the bridge and over a sufficiently wide angle to remove the present objectionable effects on the navigation of the river. The light so intercepted would be thrown along the length of the bridge in order to increase the general illumination and light up the spaces which would otherwise be in shadow, owing to the position of the reflecting screens on adjacent lamps."



*Fig. 3.—Specimens of Surface Ornamentation.*

Within the past few years a good deal has been done to make vertical boilers more economical, and recent designs show marked improvements over the older and plainer forms. In these the hot gases found too ready and direct an exit into the chimney, while in the later systems they are baffled and bent and deflected in various ways before being permitted to escape. As a result there are now some types of vertical boiler which, without being seriously complicated, can take rank with the most economical steam generators in use.

Enormous deposits of sawdust in the Ottawa River are making trouble, not only threatening to close navigation, but, owing to explosions of gas generated from decomposition, vessels are sometimes thrown into the air. Mr. Arnold, chief mechanical engineer of the Public Works Department, at Ottawa, speaks of seeing as many as three explosions of this sort in a single week. He was surprised that there had not been some loss of life on this account. A difficulty was likewise experienced by the steamboats on the Ottawa in keeping their pumps in order, owing to the sawdust getting into the machinery. Sandwash could be dredged out and lowered into barges and got rid of by being dumped into deep water. Sawdust, however, would have to be carried on shore and either dried or burned, or thrown into deep gullies.

## Hudson's Hose Mender.

This article, the invention of C. E. Hudson, who is widely known as manufacturer of apple parers, Leominster, Mass., is put on the market by the Boston Woven Hose Company, Boston, Mass., with a branch house in Chicago. It is represented in the accompanying illustration, which shows the manner in which it is applied to the hose. As will be inferred from the cut, the device consists of a thin metallic tube for insertion in the hose, a piece of soft brass wire of suitable length with a hook formed on each end and a pair of pliers for putting the bands on the hose. The manner in which the wire is held in the pliers and applied to the hose is indicated in the cut, which also shows the fastening complete. The metallic tube has a groove near each end, into which the hose is forced by the pressure of the wire. The pliers are made entirely of steel and are strong and durable and so pivoted together that when the handles are pressed together the jaws are opened. By this means ample tension is applied to the wire, when by twisting the wire while under strain one-half round the ends of the wires are firmly locked together. The operation is completed by so turning the pliers that the hooks lie flat upon the hose, as shown in another part of the cut, when the pliers are removed and the hook ends imbedded in the hose by striking them with the heavy end of the pliers. This hose-mending apparatus is put up in a neatly labeled box, 7 inches long by 2 inches square, which contains one pair of pliers, eight thimbles and 16 wires. The pliers and thimbles are practically indestructible and the wires can be purchased separately. The advantage possessed by this device in the security with which the hose is attached to the thimbles, the wire pressing it into the groove, and the rapidity with which the operation can be performed, as well as the comparative inexpensiveness of the apparatus, are points which are emphasized by the manufacturers.



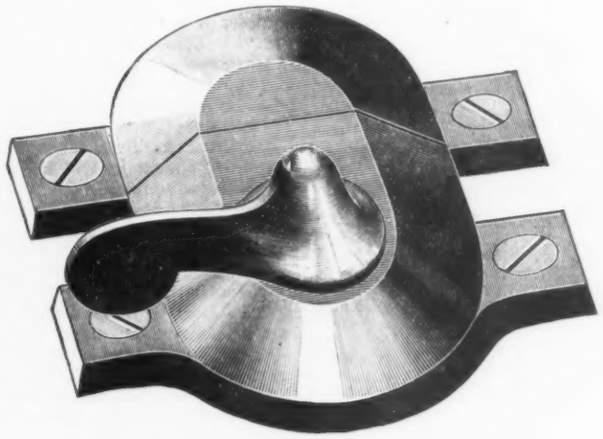
*The Hudson Hose Strap.*

Patents were granted on the 8th inst. to Alfred B. Wilson and E. Norton, of Chicago, for a machine for soldering the sides and seams of cans; also, to Peter Hansen, of the same city, for a tank supply regulating valve.

An extraordinary pressure of natural gas in the mains in Buffalo caused the gas meters to explode in various parts of the city, in some instances with destructive effects. St. Paul's cathedral, the finest church edifice in the city, took fire and was wholly destroyed.

### The Rose Sash Lock.

The Andrus Mfg. Company, Rochester, N. Y., among the goods described in their recent catalogue, illustrate the Rose Sash Lock, a cut of which is given herewith. In this sash lock there are no springs, it being operated by an eccentric by which the meeting rails are described as drawn together in such a way as to make them

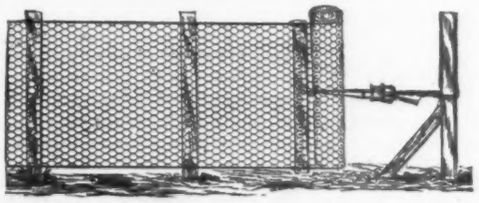


*The Rose Sash Lock.*

perfectly tight, preventing all rattling and keeping out dust and cold air. The lock is manufactured under the personal supervision of F. L. Rosentreter, the patentee. The locks are referred to as especially adapted to public buildings, as they are capable of forcing heavy sash to place and locking them securely. They are made in the following styles: Plain iron bronzed, iron bronzed polished, bronze knob, plain wire bronze metal polished and plain wire bronze metal dark.

### The Perry Wire Stretcher.

The Gilbert & Bennett Mfg. Company, manufacturers of wire goods, at Georgetown, Conn., with branch houses at New York and Chicago, have devised a method for stretching web fencing or poultry netting, which will commend itself to our readers. It is generally a difficult task for one who is not an expert to erect a fence of this kind free from waving or bagging. The method recommended by the Gilbert & Bennett Company is shown in the accompanying cut, and is so simple that it can be followed by any one. The posts are first set up, 8 to 10 feet apart, with rail or base board, or 12 to 20 feet apart if no rail or baseboard is used. Several rods of fencing are then rolled out, after which the end is stapled securely to the starting post, a proper distance from the ground. Next, the posts are marked where the top selvage of the fencing should come, and nails are driven at that mark in three or four posts, on which the fencing is hung. Now comes the important part. A piece of board, long enough to reach the entire width of the fencing, is taken for use as a grapple. Into this grapple nails are driven obliquely, just far enough apart to catch between the meshes of the fencing. The grapple is then connected with the fencing at the third or fourth post, being fastened securely to the selvages at the top and bottom so that it cannot tip or pull away. A wire stretcher is attached to the middle of the grapple, as shown in the cut, the fencing is drawn tight, and stapling to the post is an easy matter. It is of no consequence how wide the fencing may be, as this method of erecting it will secure a uniform tension and a smooth, even surface. The Chicago warehouse of the company, at 148 Lake street, contains an exhibit of this device, showing the efficiency of the Perry wire stretcher in doing the work.



*The Perry Wire Stretcher.*

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The gathering of farm statistics in Michigan shows how some of our adopted citizens accumulate fortunes. Of the farms of Michigan 31,570 are owned by citizens of foreign birth, 8067 of whom had a little over $500 each on an average when they came to this country, or $4,600,000 in the aggregate. The remaining 23,503 had nothing. The assessed value of the 31,570 farms is $52,537,871, and their cash value at least 25 per cent. more, or a total of over $65,500,000, about $2100 for each farm. These farms are mortgaged to the amount of $11,191,714. Add to this the $4,600,000 these foreigners brought with them, and we have $15,791,714 as the debit side of the account. Subtract this from the cash value of the 31,570 farms and we have nearly $50,000,000 as the net profit which these people have been enabled to make since they came to this country over and above a comfortable subsistence. The $11,191,714 for which these farms are mortgaged is part of the purchase price, now in rapid course of liquidation.

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Lord Salisbury defends the British Government from the allegation that the army and navy have been neglected, and, in so doing, remarks that the Government are "fully conscious that any disregard of the national defenses in the present state of the world would be a very grave dereliction of duty."

### Little Giant Boiler Spread.

The accompanying illustration represents a boiler spread that is being introduced by Wilcox Brothers, 212 Lake street, Chicago, Ill. It is made of heavy charcoal iron, and spreads open a plan, which will be understood by reference to the engraving. The handle, fastened to the disk and pivoted in the center, has an eccentric slot. In this a stud is placed, and the revolution of the handle causes the two parts of which the article is composed to spread or extend. We learn from the manufacturers that a half turn of the handle will force the heaviest tin into

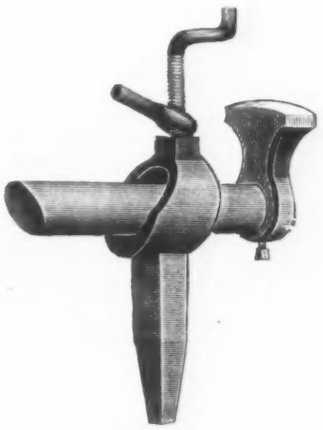


*Little Giant Boiler Spread.*

place, either in oval or square shaped cans. The bolt or stud may be removed, and by placing it at different points the article can be made to work to different widths. By substituting plates made for special purposes the usefulness of the tool can be almost indefinitely extended. The makers direct attention to several leading qualities possessed by this article. It is simple in construction and operation, and yet powerful enough to force three and four cross tin into place and hold it until the edge or bottom is run on by the setting-down machine. The regular size which they are manufacturing is calculated for Nos. 7, 8 and 9 boilers, the three in one. Other sizes are made as demanded.

### Tea-Kettle Stake.

The tool shown in the accompanying engraving for double seaming tea-kettles is manufactured by F. Fellinger, Dunkirk, N. Y. It is an article referred to by numerous correspondents in a discussion that has recently taken place in our Letter-Box department. The manufacturer describes it as a stakeholder with a tea-kettle seaming attachment. The stakeholder has a square shank to set in the bench, the same as any common stake. It will hold a bar stake or pipe 2½ inches in diameter or less. The stake can be used long or short, or all on one side, as may be desired. This is claimed to be an important advantage over the old style stake with solid shanks. The tea-kettle head shown in the cut has been designed specially for tea-kettle work, but, as the intelligent reader will perceive, may be used on many other articles with breasts. When it is turned top down it is in position to be used for riveting ears on to tea-kettles.



*Tea Kettle Stake.*

# Foreign Markets.

EQUIVALENTS.

| | Cents. |
|---|---|
| Franc, Peseta or Lira | 19.3 |
| Florin (Netherlands) | 40.2 |
| Florin (Austria) | 35.9 |
| Milreis (Portugal) | $1.08. |
| Milreis (Brazil) | 54.6 |
| Mark (Germany) | 23.8 |
| | Pounds. |
| Kilogram | 220.5 |
| Picul | 134. |

## EAST INDIES.

MANILA, May 7, 1888.—*Hemp.*—The market has been steady at $8.12½ ℔ picul, as compared with $8.25 last year, equaling £27. 10/, cost and freight, ℔ ton, against £27. 15/6. Clearances for the United States since January 1 amount to 70,000 bales, against 76,000; loading for ditto, 4000, against 27,000; cleared for England since January 1, 119,000, against 79,000; loading for ditto, 4000, against none; cleared for all other ports, 28,000, against 14,000; receipts at all ports since last cable, 5000 bales, against 7000; ditto since January 1, 206,000, against 158,000 and 128,000. Freight, $5.50. *Exchange*, six months' sight on London, 3/5, the same as in 1887.—*Ker & Co., to Charles Nordhaus, New York, per cable direct.*

## GERMANY.

HAMBURG, May 5, 1888.—*Iron.*—Whatever change there has been in the general condition of the Iron trade in Rhenish Westphalia during the week has been for the better. The demand for Pig Iron was brisker; the buying once more of Spiegel for American account is also an encouraging sign. The price remains 59 marks for 10 @ 12 % manganese. Forge Pig has been brisker and is very firm; the present range is moderate. Foundry Pig is also selling more readily at 51 to 58 marks. This may also be said of Thomas, worth 45 @ 46, and German Bessemer, 54 @ 55. The rolling mills have done rather better at home, whereas the export remains insignificant: they are well booked. The spring trade is setting in. The outlook is reassuring, although specifications are still delayed somewhat. Prices are not very remunerative. No abatement is noticeable in the demand for Boiler Plates. It is different with Thin Sheets, still neglected, especially at Siegen. The building season may alter this. The Wire branch is improving slightly in the domestic department. Both foundries and machine shops are getting on fairly well. There is a complaint, however, that the margin of profit is not large enough, in Cast-Iron Pipes particularly. Pig Iron production in Germany, Luxembourg included, was 359,772 tons in March last, against 315,713 in 1887; from January 1 to April 1 it has been 1,045,575 tons, against 885,818 last year. The March output in 1888 comprised 176,618 Forge and Spiegel, 34,781 Bessemer, 104,592 Thomas and 43,781 Foundry. *Metals* are unsettled by the decline in Tin. Quotations are altogether nominal.—*Borsenhalle.*

## FRANCE.

PARIS, May 5, 1888.—*Metals.*—The spring demand has been interfered with by the uncertain aspect of the market and values. While both Copper and Spelter have been nominally sustained Lead has weakened and for Tin there is no quotation. We quote in francs ℔ 100 kg.: *Copper*, Chili Bars, 200 @ 205; Ingots and Slabs, 202.50; Best Selected, 207.50; and pure Corocoro Ore, 180. *Lead*, 35.50 @ 36.50; and *Spelter*, 49 @ 49.50. *Iron.*—Advices from Saint Dizier are favorable. Rolling mills are fully booked at 14 @ 15 francs ℔ 100 kg. for Merchant. A great demand, filled with difficulty, exists for Iron Wire at 20 @ 21 francs, and Galvanizad at 26, No. 20. Wire Nails No. 18 are in steady request at 22, and Polished Chains, Nos. 22 to 23, at 38 @ 40. At Valenciennes the rolling mills are also doing well, and Bolt and Rivet works have received orders to keep them busy for some months to come. This relates equally as much to foundries and Hollow-Ware manufacturers. As a general thing, however, makers are dissatisfied with the prices current for their manufactures. —*Moniteur des Intérêts Matériels.*

## BELGIUM.

BRUSSELS, May 5, 1888.—*Iron.*—The larger rolling mills, especially those having their own blast furnaces, continue reporting favorably, while the smaller concerns, obliged to pay the high prices current for Pig Iron, complain of a lack of orders, for export particularly. They indeed find it difficult to compete abroad. Meanwhile the importation of Forge Pig is steadily assuming greater proportions; a desirable quality of English is laid down at Charleroi at 5.30 francs ℔ 100 kilos, whereas Domestic continues to be held at 5.40 @ 5.50. Finished is sustained; Beams are bringing 11.50 at the works, and 12 francs f.o.b. at Antwerp. —*Moniteur Industriel.*

## AUSTRIA.

VIENNA, May 2, 1888.—*Iron.*—The building season has been setting in slowly in this city, while in the provinces it is in full swing. Prices are firm, those of Pig Iron particularly so, two blast furnaces of the Witkowitz Company being blown out for repairs. Merchant Iron, Boiler Plates and Sheet Iron generally are in good request; the Alpine Company sold its entire output three months ahead. Hardware is brisker. A good rolling stock demand prevails; the Hungarian roads alone have ordered 50 locomotives. All Austrian locomotive and car works are fully booked for a year to come. Nobel Brothers, of St. Petersburg, have ordered 10 Petroleum tank cars for August for the Trieste entrepôt. Official returns are given of Austro-Hungarian Iron exportation in metrical cwts. of 100 kilos. Following are the details showing a notable increase:

| | 1886. | 1887. | Diff'ce. |
|---|---|---|---|
| Grand total of exports | 289.646 | 332.241 | + 42.595 |
| Distributed as follows: | | | |
| Merchant Iron | 74.425 | 116.240 | + 41.815 |
| Billets | .... | 414 | + 414 |
| Ingots | 3.396 | 5.648 | + 2.252 |
| Rails | 5.105 | 12.905 | + 7.800 |
| Wire | 7.059 | 8.264 | + 1.205 |
| Castings | 22.402 | 27.980 | + 5.578 |
| Cast Iron Pipe | 1.252 | 1.323 | + 71 |
| Steam Boilers | 853 | 864 | + 11 |
| Other Boilers | 34 | 343 | + 309 |
| Scythes | 23.512 | 24.091 | + 579 |
| Nails | 13.331 | 13.591 | + 260 |
| Wire Nails | 743 | 4.743 | + 4.000 |
| Guns | 3.733 | 7.961 | + 4.228 |
| Sheets and Plates | 28.139 | 15.380 | — 12.759 |
| Hardware | 60.388 | 49.411 | — 10.977 |
| Other manufactures | 45.274 | 43.083 | — 2.191 |

The chief customers of Austria are the Danubian kingdoms, Italy and Germany; next to them, Russia and Switzerland, Servia and Roumania taking large amounts of agricultural implements in particular. *Metals*—Have been dull and unsettled.—*Handel's Journal.*

## Magnitude and Importance of the Steel Rail Industry.

Cyrus Elder, of Johnstown, Pa., an eminent writer on political economy, has recently issued in pamphlet form a very able argument against reducing the duty on steel rails. The pamphlet is entitled "Steel Rails, the Railroads and the People." The motive for presenting this argument for public consideration at the present time is, of course, the introduction in Congress of the Mills Tariff bill. The report of the majority of the Ways and Means Committee of the House of Representatives in favor of the passage of the bill is critically discussed, and a complete refutation is made of the statement in the report that the increased cost of domestic steel rails over the quoted price of foreign rails is an advance in the cost of constructing railroads upon which farmers must pay interest and dividends by way of higher freights upon their farm products sent to market. By means of a very comprehensive graphic exhibit, Mr Elder shows that the prices of rails have not been a controlling factor year after year in fixing freight rates charged by the railroad companies, also, that there is no well-defined relation between the prices of rails and the building of new railroads. The regular and long continued shrinkage in prices for rails prevailing year after year for a period of five years, from 1873 to 1878, did not induce railroad building. When low rates of freight or an increased construction of railroads have concurred with low prices of rails, some other cause has operated. The substitution of the steel rail for the iron rail is shown by Mr. Elder to have been a most potent influence in cheapening the cost of railroad transportation, in lengthening the duration of the track and reducing the cost of repairs, in permitting the use of heavier rolling stock, in enabling the speed of trains to be increased, and in other improvements which date from the time of the general introduction of the use of steel rails in this country. Mr. Elder pertinently asks, "Are the railroad companies under any obligations to reduce freight rates if Mr. Mills and his colleagues shall succeed in cutting down the prices of rails by their proposed reduction of the duty?" The advance in rates which they have been able to make since the passage of the Interstate Commerce act is a striking evidence of their adherence to the rule of taking all that the traffic will bear.

A very striking statement is made in this pamphlet of the benefits which the general railroad traffic of this country derives from the steel works, whose prosperity is seriously threatened by the Mills tariff bill. Mr. Elder states that in the year 1887 one Bessemer steel company, whose works are located in Pennsylvania, contributed to the railroad companies 226,364,977 tons of freight moved one mile, including merely the ores, coke, clay, ganister and finished product, although there are numerous other materials and supplies upon which transportation was necessarily paid. Taking the statistics of the entire freight traffic in 1886 of a number of States, as given in Poor's Manual, it is found that the railroad tonnage of this one steel works nearly equaled that of the State of Louisiana. It was equal to 42 per cent. of the railroad traffic of Texas, so that two and a half such companies would have supplied all the railroad tonnage of that State. It was nearly twice the tonnage of South Carolina, more than three times the tonnage of North Carolina, two and a half times the tonnage of Arkansas, nearly five times the tonnage of Florida or West Virginia, almost eight times the tonnage of Mississippi, and was in excess of the tonnage of a number of other States. Tables are given to support these statements and calculations. This may appear striking, but it does not tell the whole story. Depending upon this steel company in its various operations there are six mining towns and a large manufacturing city containing a population of about 30,000, and all their supplies which have a railroad haul and the traffic and travel which go with their prosperity should be added to this statement and will swell it greatly.

These figures are for but one steel rail company. If these were multiplied by the entire number of companies which are distributed through the country from the Atlantic seaboard to the Rocky Mountains, the magnitude of the railroad traffic which they support would be shown to be marvelously great. But the interdependence of business is multifarious, and incidental and collateral activities called into being by these great manufacturing operations should not pass unnoted. Mr. Elder argues that if their prosperity should be seriously impaired by the destructive competition of cheap foreign rails with domestic rails, not only would the blighting influence be felt in a broad field of business activity, but there are lines of railroad which it would not pay to operate. As Mr. Elder says, if deprived of the traffic furnished by the steel companies, they would be abandoned and the grass would grow over them. To further show the direct benefit railroads receive from the steel rail manufacturers, Mr. Elder states that the books of one company show that in 1887 the cost of transporting to their works the ores, coke, limestone, clay and ganister used in making each ton of rails amounted in that year to $12.75. The total amount paid for rail freight on these materials in that one year and by that one company was $1,591,-332.92.

The pamphlet is a fresh, timely and most valuable contribution to the discussion of the important question of maintaining our domestic industries in their integrity, which is now proceeding in every part of the country, outside of Congress as well as in it.

# CURRENT HARDWARE PRICES.

## MAY 16, 1888.

*Note.*—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

### Ammunition.

*Caps, Percussion,* ₩ 1000—
dicks & Goldmark's
F. L. Waterproof, 1-10's..... 50¢
E. B. Trimmed Edge, 1-10's..... 65¢
E. B. Ground Edge, Central Fire, 1-10's. 70¢
Double Waterproof, 1-10's..... $1.40
Musket Waterproof, 1-10's..... 52¢
G. D.....
S. B.....
} dis 25@ 25& 7½ %
Union Metallic Cartridge Co.
F. C. Trimmed..... 50¢
F. L. Ground..... 65¢
Gen. Fire Ground..... 70¢
Double Waterproof..... $1.40
Double Waterproof, in 1-10's..... $1.40
} dis 25@ 25& 7½ %
S. B. Genuine Imported..... 45¢
Eley's E. B..... 54¢ @ 56¢
Eley's D Waterproof, Central Fire..... $1.60

*Cartridges—*
Rim Fire Cartridges..... dis 50&5&2 %
Rim Fire Military Cartridges..... dis 15&2 %
Cen. Fire Cartridges, Pistol and Rifle.... dis 25&5&2 %
Cen. Fire Cartr., Military & Sporting.... dis 15&5&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges .22 cal..... $1.75, dis 2 %
Blank Cartridges, 32 cal..... $3.50, dis 2 %
Primed Shells and Bullets ..... dis 15&5&2 %
B. B. Caps, Round Ball..... $1.75, dis 2 %
B. B. Caps, Conical Ball, Swaged..... $2.00, dis 2 %

*Primers—*
Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells)..... $1.00, dis 2 %
All other Primers, all sizes..... $1.20 dis 2 %

*Shells—*
First quality, 4, 8, 10 and 12 gauge.... dis 25&10&2 %
First quality, 14, 16 and 20 gauge ($10 list)..... dis 30&10&2 %
Star, Club, Rival and Climax Brands, 10-gauge, $9 list } dis 33⅓&10 %
Climax Brands, 12-gauge, $8 list } 2 %
Club, Rival and Climax Brands, 14, 16 and 20 gauge..... dis 30&10&2 %
Selbold's Combination Shot Shells..... dis 15&2 %
Brass Shot Shells, 1st quality..... dis 60&2 %
Brass Shot Shells, Club, Rival & Climax... dis 65&2 %

*Shells Loaded—*
List No. 19, 1887..... dis 20 & 10 %

*Wads—*
U. M. C. & W. R. A.—B. E., 11 up.... $2.00
U. M. C. & W. R. A.—B. E., 9&10..... 2.30
U. M. C. & W. R. A.—B. E., 7&8..... 2.60
U. M. C. & W. R. A.—P. E., 11 up.... 3.10
U. M. C. & W. R. A—P. E., 9&10..... 4.00
U. M. C. & W. R. A.—P. E., 7&8 ... . 4.90
} dis 20&2 %
Eley's B. E., 11 up..... $1.75
Eley's P. E., 11 @ 20..... $2.80

**Anvils.**—Eagle Anvils..... ₩ ℔ 10¢, dis 20 @ 20&5 %
Wright's..... 9¼¢
Armitage's Mouse Hole..... 8¾¢
Armitage Mouse Hole, Extra..... 11¼@11½¢
Trenton..... 9¼@9½¢
Wilkinson's..... 9½@10¢
J. & Riley Carr, Patent Solid..... 11@11½¢

*Anvil Vise and Drill—*
Millers Falls Co..... $18.00, dis 20 %
Cheney Anvil and Vise..... dis 25 %
Allen Combined Anvil and Vise..... $3, dis 40&10 %
Moore & Barnes Mfg. Co..... dis 33⅓ %

### Augers and Bits.

Douglass Mfg. Co.
New Haven Copper Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher)
} ..... dis 70 %
Cook's, Douglass Mfg. Co..... dis 55 %
Cook's, New Haven Copper Co... dis 50&10&50&10&5 %
Ives' Circular Lip..... dis 60 %
Patent Solid Head..... dis 30 %
C. E. Jennings & Co., No. 10, extension lip..... dis 40 %
C. E. Jennings & Co., No. 30..... dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₩ set, 32½ quarters, No 5, $5; No. 30, $2..... dis 20 %
Lewis' Patent Single Twist..... dis 45 %
Russell Jennings' Augers and Bits..... dis 25 %
Imitation Jennings' Bits (new list)..... dis 60@65&5 %
Pugh's Black..... dis 20 %
Car Bits..... dis 50&10@60 %
L'Hommedieu Car Bits..... dis 15&10 %
Forstner Pat. Auger Bits..... dis 10 %

*Hollow Augers—*
Ives
French, Swift & Co.
Douglass'
} dis 25&10 @ 25&10&5 %
Bonney's Adjustable ₩ doz. $48..... dis 40&10 %
Stearns'..... dis 20&10 %
Ives' Expansive, each $4.50..... dis 50&10 %
Universal Expansive, each $4.50..... dis 20 %
Wood's..... dis 25 @ 25&10 %

*Expansive Bits—*
Clark's small, $18; large, $26..... dis 35 @ 35&5 %
Ives' No. 4, per doz., $60..... dis 35 @ 40 %
Swan's..... dis 40 %
Steer's, No. 1, $26; No. 2, $22..... dis 35 %
Stearns' No. 2, $48..... dis 20 %

*Gimlet Bits—*
Common..... ₩ gross $2.75 @ $3.25
Diamond..... ₩ doz. $1.10, dis 25&10 %
"Bee"..... dis 25 @ 25&5 %
Double Cut, Shepardson's..... dis 45 @ 45&5 %
Double Cut, Ct. Valley Mfg. Co..... dis 30&10 %
Double Cut, Hartwell's, ₩ gro..... $5.25
Double Cut. Douglass'..... dis 40&10 %
Double Cut. Ives'..... dis 60 @ 60&5 %

*Bit Stock Drills—*
Morse Twist Drills..... dis 50&10&5 %
Standard..... dis 50&10&5 %
Cleveland..... dis 50&10&5 %
Syracuse, for metal..... dis 50&10&5 %
Syracuse, for wood (wood list)..... dis 30 @ 30&5 %
Williams' or Holt's, for metal..... dis 50&10&10 %
Williams' or Holt's, for wood..... dis 40&10 %

*Ship Augers and Bits—*
L'Hommedieu's..... dis 15&10 %
Watrous's..... dis 15&10 %
Snell's..... dis 15&10 %
Snell's Ship Auger Pattern Car Bits..... dis 15&10 %

### Awl Hafts.

Sewing, Brass Ferrule..... $3.50 ₩ gross—dis 45&10 %
Patent Sewing, Short..... $1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long..... $1.20 ₩ doz.—net
Patent Peg, Plain Top..... $10.00 ₩ gross—dis 45&10 %
Patent Peg, Leather Top.... $12.00 ₩ gross—dis 45&10 %

### Awls, Brad Sets, &c.

Awls, Sewing, Common..... ₩ gross $1.70—dis 35 %
Awls, Shouldered Peg.... ₩ gross $2.45—dis 40@40&10 %
Awls, Patent Peg..... ₩ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad..... $2.70 ₩ gross—dis 35 %
Awls, Handled Brad..... $7.50 ₩ gross—dis 45 %
Awls, Handled Scratch..... $7.50 ₩ gross—dis 35&10 %
Awls, Socket Scratch..... $1.50 ₩ doz—dis 25 @ 30 %

### Awl and Tool Sets.

Aitken's Sets, Awls & Tools, No. 20. ₩ doz. $10—dis 50&10 %
Gray's Ad Tool Hdls., Nos. 1, $12; 2, $18.; 3. $12; 4, $9. dis 25@25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18. dis 25 %
Henry's Combination Haft..... ₩ doz. $6
Brad Sets, No. 42, $10.50, No. 43, $12.50... dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. }
Brad Sets, Stanley's Excelsior, No. 2, $4.00. } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $5.50. }

### Axes.

*Makers' and Special Brands—*
First quality..... ₩ doz. $6.00 @ $6.50
Others..... ₩ doz. $5.50 @ $5.75

### Axle Grease.

Fraser's, in bulk..... Keg ₩ ℔, 4¢; Pail, ₩ ℔, 5¢ net
Frasers, in boxes..... ₩ gross $9.50
Dixon's Everlasting, in bxs., ₩ doz., 1 ℔: $1.20; 2 ℔, $2
Dixon's Everlasting..... 10-℔ pails, each, 85¢
Lower grades, special brands..... ₩ gro $5.50 @ $7

### Axles.

—No. 1, 4¢ @ 4¾¢ No. 2, 5¼ @ 5½¢,
Nos. 7 to 18..... dis 60@55 %
Nos. 19 to 29..... dis 60&10&10@70 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets..... dis 33⅓ %
Over 10 sets..... dis 33⅓&5 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets..... dis 10 %
Over 10 sets..... dis 10&5 %

### Bag Holders.

Sprengle's Pat., ₩ doz $18..... dis 60 %

### Balances.—Spring Balances.

Common 24 ℔..... ₩ doz., $1.50—dis 50 %
Chatillon's Spring Balances..... dis 50 %
Chatillon's Circular Spring Balances..... dis 60 %

### Bells.

*Hand—*
Light Brass..... dis 70&10 %
Extra Heavy..... dis 60&10 %
White Metal..... dis 60&10&10 %
Silver Chime..... dis 25&10&5 %
Globe (Cone's Patent)..... dis 25&10 @ 35 %

*Door—*
Gong, Abbe's..... dis 25&10 @ 35 %
Gong, Yankee..... dis 40&10 %
Gong, Barton's..... dis 40&10 @ 50 %
Crank, Taylor's..... dis 25&10 %
Crank, Brooks'..... dis 50&10&2 %
Crank, Cone's..... dis 10 %
Crank Connell's..... dis 20&10 %
Lever, Sargent's..... dis 60&10 %
Lever, Taylor's Bronzed or Plated..... net
Lever, Taylor's Japanned..... dis 25&10 %
Lever, R. E. ₩ Co.'s..... dis 50&10&2 %
Pull, Brook's..... dis 50&10&2 %
Pull Western..... dis 25&10 %

*Cow—*
Common Wrought..... dis 60&10 %
Western..... dis 20&10 %
Western, Sargent's list..... dis 70&10 %
Kentucky "Star"..... dis 20&10 %
Kentucky, Sargent's list..... dis 70&10 %
Dodge, Genuine Kentucky, new list. dis 70@70&10 %
Texas Star..... dis 50&10 @ 50&10&5 %
Bull..... dis 40@40&5 %
Farm Bells..... ₩ ℔, 3¢ @ 3½¢
Steel Alloy Church and School Bells..... dis 40 %

### Bellows.—Blacksmiths'..... dis 60&10&5 @ 60 %
Moulders'..... dis 40&10 @ 50 %
Hand Bellows..... dis 40&10 @ 50 %

### Belting, Rubber.

Common Standard..... dis 75 %
Standard..... dis 70&5 %
Extra..... dis 60&10 %
N. Y. B. & P. Co., Standard..... dis 60&5&5 %
N. Y. B. & P Co., Extra Standard..... dis 50&10&5 %

### Bench Stops.

Morrill's..... ₩ doz $9—dis 50 %
Hotchkiss's ..... ₩ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10; No. 2, $9... dis 25&10&5 %
McGill's..... ₩ doz $3—dis 10 %

**Bits.**—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

### Bit Holders.

Extension, Barber's.... ₩ doz $15.00—dis 40 @ 40&10 %
Extension, Ives'..... ₩ doz $20.00—dis 60&5 @ 60&10 %
Diagonal..... ₩ doz $24.00—dis 40 %
Angular..... ₩ doz $24.00—dis 40&5 %

### Blind Adjusters.

Domestic..... ₩ per doz $3.00—dis 33⅓ %
Excelsior..... ₩ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking.. ..... dis 20 @ 20&10 %

### Blind Fasteners.

Mackrell's..... ₩ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern..... $15 ₩ gro.—dis 60&10 %
Van Sand's Old Pattern..... $15 ₩ gro.—dis 55&10 %
Washburn's Old Pattern..... $9 ₩ gro. net
Merriman's..... new list, net
Austin & Eddy No. 2008..... $9 ₩ gro. net
Security Gravity..... $9 ₩ gro. net

### Blind Staples.

Barbed, ½ in. and larger..... ₩ ℔ 8 @ 8½¢ net
Barbed, ¾ in..... ₩ ℔ 9 @ 9½¢ net

### Blocks.

Ordinary Tackle, list April 17, '85..... dis 40 %
Cleveland Block Co., Mal. Iron..... dis 50 %

### Bolts.

*Door and Shutter—*
Cast Iron Barrel, Square, &c..... dis 70 @ 70&10 %
Cast Iron Shutter Bolts..... dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list..... dis 65&10 %
Ives' Patent Door Bolts..... dis 55 %
Wrought Barrel..... dis 70 @ 70&10 %
Wrought Square..... dis 70 @ 70&10 %
Wr't Shutter, all Iron, Stanley's list..... dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's ..... dis 40&10 %
Wrought Shutter, Sargent's list. ..... dis 60&10 %
Wrought Sunk Flush, Sargent's list..... dis 55&10 %
Wrought Sunk Flush, Stanley's list ..... dis 50&10 %
Wr't B. E. Flush, Com'n Stanley's list. dis 55&10 %

*Carriage—*
Com. list June 10, '84..... dis 70&10&5 %
Genuine Eagle, list Oct., '84..... dis 75 @ 75&5 %
Phila. pattern, list Oct. 7, '84... dis 75&10@75&10&5 %
R. B. & W., old list..... dis 70 %

*Tire—*
Common, list Feb. 28, 1883..... dis 65&10 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883. dis 65&10 %
P. C. B. & N. Co., Philadel., list Oct. '84.... dis 82½ %
P.C.B.&N.Co., Keystone, Phil. list, Oct. '84..... dis 80 %
P.C.B.&N.Co., Norway, Phil. list, Oct. '84. dis 75&10 %
Am. S. Co., Norway, Phil., list Oct. 16, '84.. dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84..... dis 80 %
Am. S. Co., Philadel. list. Oct. 16, '84..... dis 82½ %
Am. S. Co., Bay State, list Feb. 28, '83..... dis 65&10 %
R. B. & W., Philadel. list Oct. 16, 1884..... dis 82 %
R. & E. Mfg. Co..... dis 65 %

*Stove and Plow—*
Stove..... dis 62½ %
Plow..... dis 60&5 %
Am. S. Co. Stove, Annealed..... dis 62½ %
R. B. & W., Plow..... dis 55 %
R. B. & W., Stove..... dis 62½ %
R. & E. Mfg. Co., Stove..... dis 62½ %
Machine..... dis 75 @ 75&10 %
Bolt Ends..... dis 75 @ 75&10 %

### Borax..... ₩ ℔ 9½@10½¢

### Boring Machines.

| Without Augers. | Upright. | Angular. |
|---|---|---|
| Douglas | $5.50 | $6.75.....dis 50 % |
| Snell's, Rice's Patent..... | 5.50 | 6.75.dis 40&10&10 % |
| Jennings..... | 5.50 | 6.75. dis45@45&10 % |
| Other Machines..... | 2.35 | 2.75.....net |
| Phillips' Pat., with Augers | 7.00 | 7.50.....net |

### Bow Pins

Humason, Beckley & Co.'s..... dis 60&10 %
Sargent & Co.'s..... $17 and $18, dis 60&10 %
Peck, Stow & W. Co..... dis 50&10 @ 5o&10&5 %

### Braces.

Backus, Nos. 110 to 114 and 31 to 33.. dis 60&5@60&10%
Backus, Nos. 6, 8, 12, 14..... dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7 .9, 11..... dis 70&10&5 %
Barber's, Nos. 10 to 16..... dis 50 %
Barber's, Nos. 30 to 33..... dis 50¢
Barber's, Nos. 40 to 63..... dis 50&10¢
Barker's, Nos. 8, 10 and 12..... dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12..... dis 65&10@70 %
Osgood's Ratchet..... dis 40&10@50 %
Spofford's..... dis 50&10 %
Ives' New Haven Novelty..... dis 70 @ 70&5 %
Ives' New Haven Ratchet..... dis 60&5 @ 60&10 %
Ives' Barber Ratchet..... dis 60&5 @ 60&10 %
Ives' Barbers..... dis 60&5 @ 60&10 %
Ives' Spofford..... dis 60&5 @ 60&10 %
Common Ball, American..... $1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30..... dis 50&10@60&5 %
Bartholomew's, Nos. 117 118 119..... dis 70 @ 70&5 %
Amidon's Barker's Imp'd Plain..... dis 75&10 @ 80 %
Amidon's Barker's Imp. Nickeled..... dis 65&10 @ 70 %
Amidon's Ratchet..... dis 75&10 @ 80 %
Amidon's Eclipse Ratchet..... dis 60 %
Amidon's Globe Jawed..... dis 40&40&10 %
Amidon's Corner Brace..... dis 40 @ 40&10 %
Amidon's Universal..... 8 in., $2.10; 10 in., $2.25
Amidon's Buffalo Ball..... $1.10 @ $1.15
P. S. & W..... dis 50&10 %

### Brackets.

Shelf, plain, Sargent's list..... dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list..... dis 60&10 @ 60&10&10 %
Reading, plain..... dis 60&10 @ 60&10&5 %
Reading, Rosette..... dis 60&10 @ 60&10&10 %

### Bright Wire Goods.—..... dis 75&10&10@— %

**Broilers.** } Inch. ₩ 10 ₩ x 11
Henis' Self-Basting.. } Per doz..... $4.50 5.50 6.50

### Buckets.—See Well Buckets and Pails.

### Bull Rings.—Union Co. Nut..... dis 55 %

Sargent's..... dis 60%&10 @ 70&5 %
Hotchkiss' low list..... dis 50 %
Humason, Beckley & Co.'s..... dis 70 %
Peck, Stow & W. Co.'s..... dis 50&10 @ 60&10&10 %
Elitrich Hdw. Co., White Metal, low list. dis 50@50&10 %

### Butcher's Cleavers.

Bradley's..... dis 25 @ 30
L. & I. J. White..... dis 20&5 %
Beatty's..... dis 40 @ 40&5%

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| $16.50 | 19.00 | 21.50 | 24.00 | 27.00 | 30.00 | 33.50 | 36.50 |

New Haven Edge Tool Co.'s..... dis 40
P. S. & W..... dis 33⅓&5 @ 33⅓&10

### Butts.

*Brass—*
Wrought Brass..... dis 70@70&10 %
Cast Brass, Tiebout's..... dis 33⅓ %
Cast Brass, Corbin's Fast..... dis 33⅓&16 %
Cast Brass, Loose Joint..... dis 33⅓&10 %

*Cast Iron—*
Fast Joint, Narrow..... dis 50&10
Fast Joint, Broad..... dis 55&10
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns.
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned.
Loose Pin, Acorns, Jap, Pltd. Tips.
} dis 66⅔&10

*Wrought Steel—*
Fast Joint, Narrow..... dis 70&10 %
Fast Joint, Lt. Narrow..... dis 70&10 %
Fast Joint, Broad..... dis 70&10 %
Loose Joint, Broad..... dis 70&10&5 %
Table Butts, Back Flaps, &c..... dis 70&10 %
Inside Blind, Regular..... dis 70&10 %
Inside Blind, Light..... dis 70&10 %
Loose Pin, Wrt..... dis 70&5@70&10 %
Loose Pin, Light..... dis 70&5@70&10 %
Bronzed Wrought Butts..... dis 40&10@40&10&5 %

### Calipers.—See Compasses.

### Calks, Toe

Gautier..... ₩ ℔ 5½@6¢
Dewicks..... ₩ ℔ 5½@6¢

### Can Openers.

Messenger's Comet..... ₩ doz $3.00, dis 25 %
American..... ₩ gross $3.00
Duplex..... doz 25¢, dis 15 @ 20 %
Lyman's..... ₩ doz $3.75, dis 20 %
No. 4, French..... ₩ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle..... ₩ gross $6.00, dis 45 @ 50 %
Eureka..... ₩ doz $2.50, dis 10 %
Sardine Scissors..... ₩ doz $2.70@$3.00 %
Star..... ₩ doz $2.75 %
Sprague, No. 1. ₩; 2 3, $2.50..... dis 50&10&1¼ %

World's Best, ₩ gross, No. 1, $12.00; No. 2, $24.00, No. 3, $36.00.....dis 50&10 %
Universal.....₩ dos $3.00, dis 35&5 %
Domestic.....₩ dos $2.50, dis 45 %
Champion.....₩ dos $2.00, dis 50 %

**Cards.**
Horse and Curry.....dis 10 @ 10&10 %
Cotton.....New list, Aug., 1883, dis 10 %
Wool....." " " dis 10 %

**Carpet Stretchers.**
Cast Steel, Polished.....₩ dos 12.25
Cast Iron, Steel Points.....₩ dos 80¢
Socket.....₩ dos $1.75
Bullard's.....dis 25 @ 25&10 %

**Carpet Sweepers.**
Bissell No. 6.....₩ dos $17.00
Bissell No. 7 New Drop Pan.....₩ dos $19.00
Bissell Grand.....₩ dos $36 00
Grand Rapids.....₩ dos $24.00
Crown Jewel.....No. 1, $18; No. 2, $19; No. 3, $20
Magic.....₩ dos $15.00
Jewel.....₩ dos $17.00
Mystic.....₩ dos $16.00
Cottage.....₩ dos $15.00
Garland.....₩ dos $18.00
Parlor Queen.....₩ dos $24.00
Housewife's Delight.....₩ dos $15.00
Queen.....₩ dos $16.00
Queen, with band.....₩ dos $18.00
King.....₩ dos $30.00
Weed Improved.....₩ dos $18.00
Hub.....₩ dos $16.00
Cog Wheel.....₩ dos $16.00

**Cartridges.**—See Ammunition.

**Casters.**
Bed, Plate, Shallow Socket } New list: Brass...dis 55 @ 55&5 %; Others...dis 60 @ 60&5 %
Deep Socket.....40&10 %
Yale Casters, list May, 1884.....dis 30&10@40 %
Yale, Gem.....dis 50@60&5 %
Martin's Patent (Phœnix).....dis 45&10 @ 50 %
Payson's Anti-friction.....dis 60 @ 60&10 %
"Giant" Truck Casters.....dis 10 @ 10&5 %
Stationary Truck Casters.....dis 45&10

**Cattle Leaders.**
Humason, Beckley & Co.'s.....dis 70 %
Sargent's.....dis 60%&10 %
Hotchkiss.....dis 30 %
Peck Stow & W. Co.....dis 50&10 %

**Chain.**
Trace, 6¼-10-2, exact sizes, ₩ pair, $1 03 } dis 50&10&5
Trace, 6¼-10-3, exact sizes, ₩ pair, .92 } @ 50&10&7½ %
Trace .7-10-2, exact sizes...₩ pair, 1.11 }
NOTE.—Traces, "Regular" sizes 3¢ net ₩ pair less than exact.
Log, Fifth, Stretcher, and other ranch Chains, list Nov. 1, 1884.....dis 50&10 @ 50&10&5 %
American Coil 5-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
In cask lots. 9.00 6.30 5.25 4.60 4.40 4.20 3.95 3.75
Less than cask lots, add ¼¢@½¢ ₩ ℔.
German Coil, list of June 20, 1887...dis 50&10&5@60 %
Ger. Halter Chain, list of June 20, 1887.....dis 50&10&5@60 %
Covert Halter, Hitching and Breast.....dis 50&2 %
Covert Traces.....dis 35@2 %
Oneida Halter Chain.....dis 60 @ 60&5 %
Galvanized Pump Chain.....₩ ℔ 6¢ @ 6½¢
Jack Chain, Iron.....dis 70&10 @ 75 %
Jack Chain, Brass.....dis 65 @ 70 %

**Chalk.**
White.....₩ gro 50¢
Red.....₩ gro 70¢
Blue.....₩ gro 85¢
White Crayons.....₩ gro 12¢ @ 12½ dis 10¢

**Chalk Lines.**—See Lines.

**Chisels.**
*Socket Framing and Firmer—*
P., S. & W., New Haven and Middlesex, Mix } dis 75&5 @ 75&10 %
Buck Bros.....dis 50 %
Merrill.....dis 60&10@60&10&5 %
L. & I. J. White.....dis 30 @ 30&5 %
Witherby and Douglass.....dis 75 @ 75&5 %
Tanged Firmers.....dis 40&10 %
Tanged Firmers, Butcher's.....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.....$5.00 to £
Tanged Firmers, Buck Bros.....dis 30 %
Cold Chisels, ₩ ℔.....16¢ @ 19¢

**Chucks.**
Beach Patent.....each, $3.00, dis 20 %
Morse's Adjustable.....each, $7.00, dis 20 @ 20&5 %
Danbury.....each, $6.00, dis 30 @ 30&5 %
Syracuse, Bals Pat.....dis 25 %

**Clamps.**
Providence Tool Co.'s Wrought Iron.....dis 25 %
Adjustable, Gray's.....dis 20 %
Adjustable, Lambert's.....dis 20 %
Adjustable, Snow's.....dis 40&5 %
Adjustable, Hammer's.....dis 15 %
Adjustable, Stearns'.....dis 20&10 %
Stearns' Adjustable Cabinet and Corner...dis 20&10 %
Cabinet, Sargent's.....dis 60%&10 %
Carriage Makers', Sargent's.....dis 60%&10 %
Eberhard Mfg. Co.....dis 40&5 @ 40&10 %
Warner's.....dis 40&10 @ 40&10&5 %
Saw Clamps.....See Vises

**Clips.**
Norway, Axle, ¼ & 5-16.....dis 55&5&5
Second grade Norway Axle, ¼ & 5-16.....dis 65&5
Superior Axle Clips.....dis 60%&5 @ 60%&5&5 %
Norway Spring Bar Clips, 5-16.....dis 60&5&5
Wrought-Iron Felloe Clips.....₩ ℔ 5½¢
Steel Felloe Clips.....₩ ℔ 5¢

**Cockeyes.**.....dis 50 %

**Cocks, Brass.**
Hardware list.....dis 40&10&2 %

**Coffee Mills.**
Box and Side. List revised Jan. ", 1888.....dis 50&2 %
American, Enterprise Mfg. Co.....dis 20&10&30 %
The "Swift," Lane Bros.....dis 20&10 %

**Compasses, Dividers, &c.**
Compasses, Calipers, Dividers.....dis 70@70&10 %
Bemis & Call Co.'s Dividers.....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double.....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).....dis 30 %
Excelsior.....dis 50 %
J. Stevens & Co.'s Calipers and Dividers....dis 25&10 %

**Coopers' Tools.**
Bradley's.....dis 20 %
Barton's.....dis 20@20&5 %
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %
Beatty's.....dis 40 @ 40&5 %
Sandusky Tool Co.....dis 30 @ 30&5 %

**Corkscrews.**
Humason & Beckley Mfg. Co.....dis 40 @ 40&10 %
Clough's Patent.....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert.....dis 35 %

**Corn Knives and Cutters.**
Bradley's.....dis 10 %
Wadsworth's.....dis 25 %

Cradles.—Grain.....dis 50&10 %

**Crow Bars.**
Cast Steel.....₩ ℔ 4¢
Iron, Steel Points.....₩ ℔ 3½¢

**Curry Combs.**
Fitch's.....dis 50&10 @ 50&10&10 %
Rubber.....₩ dos $10.00, dis 20 %
Perfect.....dis 50 %

**Curtain Pins.**
Silvered Glass.....net
White Enamel.....net

**Cutlery.**
Beaver Falls and Booth's.....dis 33⅓ %
Wostenholme.....$7.75 to £

## Dampers, &c.
Dampers, Buffalo.....dis 50 %
Buffalo Damper Clips.....dis 40 %
Crown Damper.....dis 40 %
Excelsior.....dis 40&10 %

**Dividers.**—See Compasses.

**Dog Collars.**
Embossed Gilt, Pope & Stevens' list.....dis 30&10 %
Leather, Pope & Stevens' list.....dis 40 %
Brass, Pope & Stevens' list.....dis 40 %

**Door Springs.**
Torrey's Rod, regular size.....₩ dos $1.30
Gray's.....₩ gro, $20.00, dis 20 %
Bee Rod.....₩ gro, $20.00, dis 20 %
Warner's No. 1, ₩ dos, $2.50; No. 2, $3.30, dis 40&10@50 %
Gem (Coil), list April 19, 1886.....dis 10 %
Star (Coil), list April 19, 1886.....dis 20 %
Victor (Coil).....dis 60 @ 60&10 %
Champion (Coil).....dis 60&10 @ 60&10&10 %
Philadelphia.....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's.....No. 1, ₩ dos $18.00; No. 2, $15.00, dis 50 %
Rubber, complete.....₩ dos $4.50, dis 55&10 %
Hercules.....dis 50 %
Shaw Door Check and Spring.....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring.....dis 25 %

**Drawing Knives.**
P., S. & W., Mix, New Haven and Middlesex } dis 75&5 @ 75&10 %
Merrill.....dis 60&10&10 %
Witherby and Douglass.....dis 75@75&5 %
Watrous.....dis 15&10 @ 25 %
L. & I. J. White.....dis 20&5 %
Bradley's.....dis 35 %
Adjustable Handle.....dis 20 @ 25 %
Wilkinson's Folding.....dis 25 @ 25&5 %

**Drills and Drill Stocks.**
Blacksmiths'.....each, $1.75
Blacksmiths' Self-Feeding.....each, $7.50, dis 20 %
Breast, P. S. & W.....dis 40&10 %
Breast, Wilson's.....dis 30&5 %
Breast, Millers Falls.....each, $3.00 dis 25 %
Breast, Bartholomew's... each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's.....dis 20 @ 20 & 5 %
Ratchet, Ingersoll's.....dis 25 %
Ratchet, Parker's.....dis 20 @ 20&5 %
Ratchet, Whitney's.....dis 20&10 %
Ratchet, Weston's.....dis 20@25 %
Ratchet, Moore's Tripie Action.....dis 25 & 30 %
Whitney's Hand Drill, Plain, $11.00, Adjustable, $12.00.....dis 20&10 %
Wilson's Drill Stocks.....dis 1? %
Automatic Boring Tools.....each, $1.75 @ $1.85
*Twist Drills—*
Morse.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Syracuse.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Williams.....dis 50&10&10 %

**Drill Bits.**—See Augers and Bits.

**Drill Chucks.**—See Chucks.

**Dripping Pans.**
Small sizes.....₩ ℔ 7 ¢
Large sizes.....₩ ℔ 6½ ¢

## Egg Beaters.
Dover.....₩ doz., $2.00
National.....₩ dos $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.).....₩ gro, $17.00@$18.00
Standard (Standard Co.).....₩ gro, $9.00
Kingston (Standard Co.).....₩ gro, $6.50
Acme (Standard Co.).....₩ gro. $6.00
Dupiex (Standard Co.).....₩ gro, $18.00
Rival (Standard Co.).....₩ gro. $12.00
Triumph (T. & S. Mfg. Co.).....₩ gro, f 10.50@$11.50
Advance No. 1.....₩ gro $10.50
Advance, No. 2.....₩ gro $10.00
Bryant's.....₩ gro $15.00
Ayres' Spiral.....₩ gro $8
Double (Hamblin & Russell Mfg. Co.).....₩ gro, $16.20
Easy (Hamblin & Russell Mfg. Co.).....₩ gro, $14.00
Triple (Hamblin & Russell Mfg. Co.).....₩ gro, $16.20
Spiral (Hamblin & Russell Mfg. Co.).....₩ gro, $4.50
Paine, Diehl & Co's.....₩ gro $4.00

**Electric Bell Sets.**—Wollensak's.....dis 15 %
Bigelow & Dowse.....dis 20 %

| Emery. | No. 4 to 40 gr. | No. 54 to 150 gr. | Flour, FF. |
|---|---|---|---|
| Kegs, ₩ ℔ | 4 ¢ | 5 ¢ | 2½¢ |
| ½ kegs, ₩ ℔ | 4½¢ | 5½¢ | 2¾¢ |
| ¼ kegs, ₩ ℔ | 4¾¢ | 5¾¢ | 3 ¢ |
| 10-℔ cans, 10 in case | 6 ¢ | 6½¢ | 5 ¢ |
| 10-℔ cans, less than 10 | 10 ¢ | 10 ¢ | 7½¢ |

**Enameled and Tinned Ware.**—See Hollow-Ware.

**Escutcheon Pins.**
Iron, list Nov. 11, 1885.....dis 50&10 @ 50&10&5
Brass.....dis 60 @ 60&5 %

**Escutcheons.**
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60 @ 60&10 %
Wood.....dis 25 %

## Faucets.
Fenn's.....dis 40 %
Bohren's Patent Rubber Ball.....dis 25 %
Fenn's Cork Stops.....dis 33⅓ %
Star.....dis 60 @ 60&5 %
Frary's Patent Petroleum.....dis 40&10&2 %
West's Patent Key.....dis 50&10 %
Anchor Lock.....dis 45 %
Metallic Key, Leather Lined.....dis 55&10 @ 60&10 %
Cork Lined.....dis 70 @ 70&10 %
Burnside's Red Cedar.....dis 50 %
Burnside's Red Cedar, bbl. lots.....dis 50&10 %
J. Sommer's Best Block Tin Key.....dis 40 %
J. Sommer's Cork Lined, 1st quality.....dis 50 %
J. Sommer's Diamond Lock.....dis 40 %
J. Sommer's Perfection, Fla. Red Cedar.....dis 50 %
J. Sommer's Goodenough Cedar.....dis 60 %
Self-Measuring, Enterprise...₩ dos $36.00—dis 20&10 %
Self-Measuring, Lane's.....₩ dos $36.00—dis 25&10 %
Self-Measuring, Victor.....₩ dos $36.00—dis 25&10 %

**Felloe Plates.**.....₩ ℔ 6 @ 6½¢

**Fifth Wheels.**—Derby and Cincinnati .dis 45&5 %

**Files.**
*Domestic—*
Best brands.....dis 60&5 @ 60&10 %
Good brands.....dis 60&10 @ 60&10&10 %
Fair brands.....dis 60&10&10 @ 70 %
Second quality.....dis 70&5 @ 75 %
Heller's Horse Rasps.....dis 50%&10 @ 50&10 %
McCaffrey's Horse Rasps.....dis 50&10 %
*Imported—*
J. & Riley Carr.....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.....dis 10 %
Moss & Gamble.....List April 1, 1883, dis 15 %
Butcher.....Butcher's list, dis 20 %
Stubs.....Stubs list, dis 25 @ 30 %
Turton's.....Turton's list dis. 20 @ 25 %
Greaves' Horse Rasps.....American list .dis 60 %

**Fluting Machines.**
Knox, 4¼-inch Rolls.....$3.25 each } dis 35 %
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Roll.....$2.15, dis 35 %
Eagle, 5¼-inch Roll.....2.85, dis 35 %
Crown, 4¼ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.....6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.....$1.50 each, net
Geneva Hand Fluter, White Metal..₩ dos $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10, dis 30 %
Shepard Hand Fluter, No. 85.....₩ dos $15.30, dis 40 %
Shepard Hand Fluter, No. 110.....₩ dos $11, dis 40 %
hepard Hand Fluter, No. 95.....₩ dos $8, dis 40 %
Clark's Hand Fluter.....₩ dos $15.00, dis 35 %
Combined Fluter and Sad Iron...₩ dos $15.00, dis 30 %
Buffalo.....₩ dos $10.00 dis 10 %

**Fluting Scissors.**.....dis 45 %

**Forks.**—Hay, Manure, &c., Asso. list.....dis 65&5 %
Hay, Manure, &c., Phila. list.....dis 60 @ 60&5 %
Plated, see Spoons.

**Freezers, Ice Cream.**
Buffalo Champion.....dis 60&10&5 %
Shepard's Lightning.....dis 65 %
White Mountain.....dis 60 %

**Fruit and Jelly Presses.**
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Henis.....₩ doz $4.50
Shepard's Queen City.....dis 40 %

**Fry Pans.**
High List.....dis 75&5 @ 75&10&5 %

| No... | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| ₩ doz... | $3.75 | 4.70 | 5.80 | 5.95 | 6.55 | 7.50 | 8.75 | 10.00 | 11.25 |

Low List.....dis 70&10 %

| No | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| ₩ doz... | $3.00 | 3.75 | 4.25 | 4.75 | 5.25 | 6 00 | 7.00 | 8.00 | 9.00 |

**Fuse.**.....₩ 1000 ft.
Common Hemp Fuse, for dry ground.....$2.70
Common Cotton Fuse, for dry ground.....2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet ground.....6.00
Triple Taped Fuse, for very wet ground.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

## Gauges.
Marking Mortise, &c.....dis 60&10 %
Wire, low list.....dis 10&10 %
Wire, Wheeler, Madden & Co.....dis 10 %
Wire, Morse's.....dis 50 @ 50&5 %
Wire, Brown & Sharpe's.....dis 10 @ 20 %

**Gimlets.**—Nail and Spike.....dis 50&10&5 %
"Eureka" Gimlets.....dis 40&10 %
"Diamond" Gimlets.....₩ gross 35.00
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ives'.....dis 60 @ 60&5 %
Double Cut, Douglass'.....dis 40&10 %
"Bee".....₩ gross $12, dis 25 @ 25&5 %

**Glue.**—Le Page's Liquid.....dis 25 @ 25&5%
Upton's Liquid.....dis 35 %

**Glue Pots.**
Tinned and Enameled.....dis 40&5 @ 40&10%
Family, Howe's "Eureka".....dis 40 %
Family, L. F. & C.'s "Handy".....dis 50 %

**Grindstone Fixtures.**
Sargent's Patent.....dis 70&10 %
Reading Hardware Co.....dis 30&10 %

## Hack Saws.—See Saws.

**Halters.**—Covert's, Rope, ¼-in. Jute.....dis 50&2 %
Covert's, Rope, ¼-in., Hemp.....dis 40&2 %
Covert's Adj. Rope Halters.....dis 40&2 %
Covert's Hemp Horse and Cattle Tie.....dis 50&2 %
Covert's Jute Horse and Cattle Ties.....dis 60&10&2 %

**Hammers.**
*Handled Hammers.*
Maydole's.....List Dec. 1, 1885, dis 25 @ 25&1 0%
Buffalo Hammer Co., C. Hammond & Son, Humason & Beckley... } List Jan. 15, '87 Dis. 50 @ 50& 10 %
Atna Tool Co.....dis 40&10 @ 50
Fayette R. Plumb.....dis 40&10 @ 50
Verree.....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.dis 30&10 %
Nelson Tool Works.....dis 40&10 %
Warner & Nobles.....dis 20 @ 25 %
Peck, Stow & Wilcox.....dis 40 %
Sargent's.....dis 33⅓&10 %
*Heavy Hammers and Sledges—*
3 ℔ and under.....₩ ℔ 40¢
3 to 5 ℔.....₩ ℔ 36¢ } dis 70 %
Over 5 ℔.....₩ ℔ 30¢ }
Wilkinson's Smiths'.....10½¢ @ 11¢ ₩ ℔

**Hand Cuffs and Leg Irons.**
Providence Tool Co., Hand Cuffs, $15.00 ₩ doz...dis 10%
Providence Tool Co. Leg Irons, $25.00 ₩ doz....dis 10 %
Tower's.....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ₩ doz, $18; Nickeled, $27; 3 Hands, Polished, ₩ doz, $72; Nickeled, $84.....dis 20 %

**Handles.**
*Iron, Wrought or Cast.—*
Door or Thumb.

| Nos..... | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Per doz.. | $0.90 | 1.00 | 1.15 | 1.35 | 1.50 |

....dis 60&10&10 %
Roggin's Latches.....₩ doz. 30¢ @ 35¢
Bronze Iron Drop Latches.....₩ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.85.....net
Barn Door.....₩ doz. $1.40, dis 10&10 %
Chest and Lifting.....dis 70 %
*Handles, Wood—*
Saw and Plane.....dis 40&10 @ 40&10&5 %
Hammer, Hatchet, Axe, Sledge, &c.....dis 35 %
Brad Awl.....₩ gross $2.00
Hickory Firmer Chisel, assorted.....₩ gross 4.50
Hickory Firmer Chisel, large.....₩ gross 5.00
Apple Firmer Chisel, assorted.....₩ gross 5.00
Apple Firmer Chisel, large.....₩ gross 6.00
Socket Firmer Chisel, assorted.....₩ gross 3.00
Socket Framing Chisel, assorted.....₩ gross 5.00
J. B. Smith Co.'s Pat. File.....dis 50 %
File, assorted.....₩ gross 2.75 } dis 40 @ 40&10 %
Auger, assorted.....₩ gross 5.00 }
Auger, large.....₩ gross 7.00 }
Patent Auger, Ives'.....dis 30&10 %
Patent Auger, Douglass'.....₩ set $1.25 net
Patent Auger, Swan's.....₩ set $1.00 net
Hoe, Rake, Shovel, &c.....dis 50&10 %
*Cross Cut Saw Handles—*
Atkins' No. 1 Loop, ₩ pair, 20¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles.....50¢, dis 60 %
Champion.....15¢

**Hangers.**
Barn Door, old patterns.....dis 60&10&10 @ 70 %
Barn Door, New England.....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction.....dis 55 %
Orleans Steel.....dis 55 %
Hamilton Wrought Wood Track.....dis 55 %
U. S. Wood Track.....dis 65 %
Champion.....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list.....dis 70 %
Climax Anti-Friction.....dis 55 %
Climax Steel Anti-Friction.....dis 50 %
Zenith for Wood Track.....dis 55 %
Reed's Steel Arm.....dis 50 %
Challenge Barn Door.....dis 50 %
Sterling Improved (Anti-Friction).....dis 50&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18.....dis 50&10 %
Cheritree.....dis 50&10 %
Kidder's.....dis 50&10 @ 60 %
The "Boss".....dis 50 %

Best Anti-Friction.....dis 60 %
Duplex (Wood Track).....dis 60 %
Terry's Patent.....₩ doz. dr., 4 in. $10; 5 in., $12.....dis 50&10 %
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18 $.....dis 50&10 @ 50&10 %
Wood Track Iron Clad..₩ ft. 10¢, dis 50&10 @ 50&15 %
Carrier Anti-Friction.....dis 50&10%
Architect.....₩ set $6.00, dis 20 %
Eclipse.....dis 20&10
Felix.....₩ set $4.50, dis 20 %
Richards'.....dis30&30&10 %
Lane's Steel Anti-Friction.....dis 40&10 %
The Ball Bearing Door Ranger....dis 20&10 @ 25&10 %
Warner's Patent.....dis 20@20&10 %
Stearns' Anti-Friction.....dis 20 @ 20&10 %
Stearns' Challenge.....dis 25&10 @ 25&10&10 %
Faultless.....dis 40 @ 40&o %
American.....₩ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....dis 40 %
Paragon, Nos. 1, 2 and 3.....dis 40&10 %
Paragon, Nos. 5, 5½, 7 and 8.....dis 20&10 %
Crescent.....dis 60@60&10 %
Nickel, Cast Iron.....dis 50 %
Nickel, Malleable Iron and Steel.....dis 40 %
Scranton Anti Friction Single Strap.....dis 33⅓ %
Scranton Anti-Friction Double Strap.....dis 40 %
Universal Anti-Friction.....dis 40 %

**Harness Snaps.**—See Snaps.

**Hatchets.**—List Jan. 1, 1886.

Isaiah Blood.....dis 35 @ 40%
Hunt's Shingling Lath and Claw.....dis 40&5 %
Hunt's Broad.....dis 40 %
Buffalo Hammer Co.....dis 40&10@50 %
Hurd's.....dis 40&10 @ 50 %
Fayette R. Plumb.....dis 40&10 @ 50 %
Wm. Mann, Jr., & Co.....dis 50 @ 50&5%
Underhill Edge Tool Co.....dis 40&5 @ 40&10 %
Underhill's Haines and Bright goods.....dis 33⅓ %
C. Hammond & Son.....dis 40&10 @ 50 %
Simmons.....dis 40&10 @ 50 %
Peck's.....dis 40&10 @ 40&10&5 %
Kelly's.....dis 50@50&5 %
Sargent & Co.....dis 50 %
Ten Eyck Edge Tool Co.....dis 40&10@40&10&5 %
Collins, following list.....dis 10 %

| | | | |
|---|---|---|---|
| Shingling, Nos. 1 2 3 | ₩ doz $5.50 | $6.00 | $6.50 |
| Claw, Nos. 1 2 3 | ₩ doz 6.00 | 6 50 | 7.00 |
| Lathing Nos. 1 2 3 | ₩ doz 5.50 | 6.00 | 6.50 |

**Hay Knives.**

Lightning.....Mfrs. price ₩ doz $18 dis 25 % ; Jobber's Extras
Electric.....₩ doz $17 } dis 30 @
Gem.....₩ doz $18 } 30&5%
Wadsworth's.....dis 40&7½ @ 40&10 %
Carter's Needle.....₩ doz $11.50 @ $12.00
Heath's.....₩ doz $13.50 @ $14.00

**Hinges.**

*Wrought Iron Hinges—*
Strap and T.....dis 70&10 @ 70&10&5 %
Screw Hook and Strap. { 8, 10, 12 in., ₩ ℔ ... 3¾¢ ; { 14 to 36 in. ₩ ℔ ... 2¾¢
Heavy Welded Hook { 8 to 12 in., ₩ ℔ ... 3¾¢ ; { 14 in. & up. ₩ ℔ ... 2¾¢
Screw Hook and Eye. { ⅜ in.... ₩ doz $1.50 } dis ; { ½ in.... ₩ doz $2.45 } 10% ; { ⅝ in.... ₩ doz $3.80 }
Rolled Blind Hinges, Nos 32 and 34.....dis 50&10 %
Rolled Blind Hinges, Nos. 232 and 234.....dis 55&10 %
Rolled Plate.....dis 70&10 %
Rolled Raised.....dis 70&10 %
Plate Hinges { 8, 10 & 12 in., ₩ ℔ ... 5 ; "Providence" } over 12 in., ₩ ℔ ... 4¢

*Spring Hinges—*
Geer's Spring and Blank Butts.....dis 40 %
Union Spring Hinge Co.'s list, March, 1886...dis 20 %
Acme and U. S.....dis 30 %
Empire and Crown.....dis 20 %
Hero and Monarch.....dis 50 %
American, Gem, and Star, Japanned.....dis 20 %
American, Gem, and Star, Bronzed.....net
Oxford, Bronze and Brass.....net
Barker's Double Acting.....dis 20&10 %
Union Mfg. Co.....dis 25 %
Bommer's.....dis 30 %
Buckman's.....dis 15@20 %
Chicago.....dis 30 %

*Gate Hinges—*
Western.....₩ doz $4.40, dis 55 %
N. E.....₩ doz $7.00, dis 55 %
N. E. Reversible.....₩ doz $5.20, dis 55&10 %
Clark's, Nos. 1 2 3.....dis 60&10 @ 60&10&5 %
N. Y. State.....₩ doz $5.00, dis 55&10 %
Automatic.....₩ doz $12.50, dis 50 %
Common Sense.....₩ doz pair $4.50, dis 50 %
Seymour's.....dis 45&10 %
Shepard's, Nos. 1, 2, 10 and 20.dis 60&10@60&10&10 %
Shepard's, No. 3.....dis 60&10@60&10&10 %
Reed's Latch and Hinges.....₩ doz sets $12, dis 50 %

*Blind Hinges—*
Parker.....dis 75&2 %
Palmer.....dis 50&5&10 %
Seymour.....dis 70&2 %
Nicholson.....dis 45&10 %
Huffer.....dis 50 %
Clark's, Nos. 1, 3, 5, 40 and 50.....dis 75&10&5@80 %
Clark's Mortise Gravity.....dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13...dis 75&10@75&10&5 %
Sargent's, No. 12.....dis 75&10&10 %
Reading's Gravity.....dis 75&10 @ 75&10&5 %
Shepard's "Noiseless." Nos. 50, 60, 65 & 55.....dis 75&10&5 %
Shepard's Niagara Gravity, Nos. 1, 3 and 5...dis 80 %
Shepard's Buffalo Gravity, Nos. 1, 3 and 5.....dis 80&2½ %
Shepard'sChampion Gravity No. 75.....dis 80&10&5 %
Shepard's Steamboat Gravity, No. 10.....dis 80&20 %
Shepard's Acme Lull & Porter.....dis 75&5@75&10 %
Shepard's O. S. Lull & Porter.....dis 75&10 %
Shepard's "Queen City" Reversible.....dis 70&10 %
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....dis 75&10&2½ %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....dis 25&2 %

**Hoes.**

*Handled—*
Garden, Mortar, &c.....dis 65&5 %
Planter's, Cotton, &c.....dis 65&5 %
Warren Hoe.....dis 60 %
Magic.....₩ doz $4.75

*Eye—*
D. & H. Scovil.....dis 15 %
Lane's Crescent Scovil Pattern.....dis 45 %
Lane's Crescent Planters Pattern.....dis 45 & 5 %
Lane's Razor Blade, Scovil Pattern.....dis 30 %
Maynard, S. & O. Pat.....dis 45&5 %
Sandusky Tool Co., " " .....dis 60 %
Hubbard & Co., " " .....dis 60 %
Bare " " .....dis 60 %
Grub.....dis 60 @ 60&10 %

**Hog Rings and Ringers.**

Hill's Improved Ringers.....₩ doz. $5.50 @ 5.75
Hill's Old Style Ringers.....₩ doz. $3.00 @ 3.25
Hill's Tongs.....₩ doz. $5.50 @ 6.00
Hill's Rings.....₩ doz boxes, $2.00 @ 2.25
Perfect Rings.....₩ doz boxes $1.75 @ 2.00
Perfect Ringers.....₩ doz. $2.50
Blair's Hog Ringers.....₩ doz, $2.60 @ $2.65
Blair's Hog Rings.....₩ doz 95¢ @ 1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz, $2.25
Brown's Ringers.....₩ doz, $2.00
Brown's Rings.....₩ doz, $1.25 @ 1.40

**Hoisting Apparatus.**

"Moore's" Hand Hoist, with Lock Brake.....dis 50
"Moore's" Differential Pulley Block.....dis 4

**Holders. Tool.**

Bals Pat.....₩ doz $4; dis 25 %

**Hollow-Ware.**

*Iron—*
Stove Hollow-Ware. Ground...dis 60&10@60&10&5 %
Stove Hollow-Ware. Unground....dis 70&5@70&10 %
Enameled and Tinned Hollow-Ware—
Kettles.....dis 70 @ 70&5 %
Oval Boilers, Saucepans & Glue Pots.....dis 40&5 @ 40&10 %
Gray Enameled Ware.....dis 40 @ 40&5 %
Agate and Granite Ware.....dis 25 %
Rustless Hollow-Ware.....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

| Inch..... | 6 | 7 | 8 | 9 |
|---|---|---|---|---|
| Each.... | 55¢ | 60¢ | 65¢ | 75¢ |

*Silver Plated*—4 mo. or 5 % oash in 30 days.
Reed & Barton.....dis 40&5 %
Meriden Brittania Co.....dis 40&5 %
Simpson, Hall, Miller & Co.....dis 40&5 %
Rogers & Brother.....dis 40&5 %
Hartford Silver Plate Co.....dis 40&5&5 %
William Rogers Mfg. Co.....dis 40&5&5 %

**Hooks.**

*Cast Iron—*
Bird Cage. Sargent's list.....dis 60&10&10 %
Bird Cage, Reading.....dis 60&10&10 %
Clothes Line, Sargent's list.....dis 60&10&10 %
Clothes Line, Reading list. dis 60&10 @ 60&10&10 %
Ceiling, Sargent's list.....dis55&10&10 %
Harness, Reading list.....dis 55&10 @ 55&10&10 %
Coat and Hat, Sargent's list.....dis 55&10 %
Coat and Hat, Reading... ...dis 50&10 @ 50&10&10 %

*Wrought Iron—*
Cotton.....₩ doz $1.25
Cotton Pat. (N. Y. Mallet & Handle W'ks).....dis 30 %
Tassel and Picture (T. & S. Mfg. Co.).....dis 50 %
Wrought Staples, Hooks, &c.....See Wrought Goods
Bench Hooks.....See Bench Stops

*Wire—*
Wire Coat and Hat, Gem, list April, 1886.....dis 45 %
Wire Coat and Hat, Miles', list April, 1886.....dis 45
Indestructible Coat and Hat.....dis 45 %
Wire Coat and Hat, Standard.....dis 45 %
Belt.....dis 75&10 @ 80
Grass.....₩ doz $2.00
Bush.....dis 55 @ 60
Whiffletree—Patent.....dis 55 %
Hooks and Eyes—Malleable Iron.....dis 70 @ 70&10 %
Hooks and Eyes—Brass.....dis 60&10&10 %
Fish Hooks, American.....dis 50 %

**Horse Nails.**

| | Nos. 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|
| Ausable | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | dis 25&10@25&10&10 % |
| Clinton. Fin. | 24¢ | 22¢ | 21¢ | 20¢ | 19¢ | dis 40&10 @ 50 % |
| Essex | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | dis 25&10@25&10&10 |
| Putnam | 24¢ | 22¢ | 21¢ | 20¢ | 19¢ | dis 5&10&2½&2½ % |
| Vulcan | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | dis 12½&5 |
| Northwest'n. | 25¢ | 23¢ | 22¢ | 21¢ | 20¢ | dis 10&10&5&5 % |
| Globe | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | dis 12½&5&5 % |
| A. C. | 25¢ | 23¢ | 22¢ | 21¢ | 20¢ | dis 25&10 @ 25& 10&5 % |
| C. B.-K. | 25¢ | 23¢ | 22¢ | 21¢ | 20¢ | dis 25&10 @ 25& 10&5 % |
| Champlain | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | dis25&10&10&5 % |
| New Haven | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | dis25&10@25&10&10 % |
| Saranac | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | dis 30&10 % |
| Champion | 25¢ | 23¢ | 22¢ | 21¢ | 20¢ | dis 10&10&10 % |
| Capewell | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | dis 35&5 @ 35&10 % |
| Star | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | dis 40&10@40&10&12½&5 % |
| Anchor | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | dis 30&5 % |
| Western | 10¢ per lb all sizes | | | | | |
| Empire Bronzed | 14 per lb. | | | | | |

**Horse Shoes.**—See Shoes, Horse.

**Hose. Rubber,** competition.....75&10 & 80 %
Standard.....dis 70@75&10 %
Extra.....dis 60@1 &10 %
N. Y. B. & P. Co., Para.....dis 30&10 %
N. Y. B. & P. Co., Extra.....dis 50&5 %
N. Y. B. & P. Co., Dundee.....dis 60&10&10 %

**Ice Picks, Chisels, &c.**

Am. Ice Chisel Pol'd.....₩ dos $3.00, dis 2[illegible] @20&5 %
National Ice Chisel.....₩ dos $6.25, dis 20 %
Novelty Ice Breakers.....₩ doz $6.25, dis 20 %
Dunlap's Ring Picks.....₩ dos $2.00, dis 15 %
Wood Head Picks, Sargent's....₩ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's.....₩ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle.....₩ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall...₩ doz $1.25, dis 20&10 %
Combination Ice Tools.....₩ doz $2.00 net
Acme Ice Pick and Tongs...₩ gross $55.00, dis 50&10 %
Roger's Lightning Ice Chisel.....₩ gross $28.50

**Ice Tongs.**

Champion, S. S. & Co.....₩ doz $4.00, dis 25&10 %
Family.....₩ doz $2.75, dis 20@25 %

**Jack Screws.**—See Screws.

**Kettles.**

| | Spun. | Stamped. |
|---|---|---|
| Brass. 7 to 17 in., ₩ ℔ | 24¢ | 22¢ |
| Brass larger than 17 inches, ₩ ℔ | 26¢ | 24¢ |
| Enameled and Tea Kettles | See Hollow-Ware | |

**Keys.**

Lock Asso'n list Dec. 20, 1886.....dis 50&10 @ 60&5 %
Eagle, Cabinet, Trunk and Padlock.....dis 33⅓&2 %
Hotchkiss' Brass Blanks.....dis 40 %
Hotchkiss' Copper and Tinned.....dis 40 %
Hotchkiss' Padlock and Cabinet.....dis 35 %
Ratchet Bed Keys.....₩ doz $4.00, dis 15 %

**Knife Sharpeners.**

Parkin's Applewood Handles.....₩ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo...₩ doz $9.00, dis 40 %

**Knives.**

Wilson's Butcher Knives.....dis 20 @ 25 %
Ames' Butcher Knives.....dis 25 %
Nichols' Butcher Knives.....dis 40&10 %
Ames' Shoe Knives.....dis 20@25 %
Ames' Bread Knives.....₩ doz $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives.....dis 20 %
Hay and Straw.....See Hay Knives
Table and Pocket.....See Cutlery

**Knobs.**

Door Mineral.....65@68¢
Door Por. Jap'd.....75@78¢
Door Por. Por. Nickel.....$2.00 @ 2.25
Door Por. Plated, Nickel.....$2.00 @ 2.25
Drawer, Porcelain.....dis 55&10&10@5&10&10 %
Hemacite Door Knobs, new list.....dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885....dis 40 %
Furniture Plain.....75¢ gross incn. dis 10 %
Furniture, Wood Screws.....dis 25&10 %
Base, Rubber Tip.....dis 70&10&5 %
Picture, Judd's.....dis 60&10&10 @ 70 %
Picture, Sargent's.....dis 60&10 %
Picture, Hemacite.....dis 35&5 %
Shutter, Porcelain.....dis 65&10 %
Carrriage, Japanned.....₩ gross 80¢, dis 60&10 %

**Ladles.**

Melting, Sargent's.....dis 65&10 %
Melting, Reading.....dis 35&10%
Melting, Monroe's Patent.....₩ doz. $4.00, dis 40%
Melting, P. S. & W.....dis 35&10 @ 40%
Melting, Warner's.....dis 30%

**Lawn Mowers.**

Standard List.....dis 50&10 %
Enterprise.....dis 60&10 %

**Lanterns.**

Tubular, Plain with Guards.....₩ doz $4.00 @ $4.25
Tubular, Lift Wire, with Guards...₩ doz $4. 0 @ $4.75
Tubular, Square Plain, with Guards, ₩ doz $4.25 @ $4.50
Tubular, Sq. Lift Wire, with Guards, ₩ doz $4.50 @ $4.75
Without Guards, 25¢ ₩ dozen less.
Police, Small, $6.00; Med. $7.25; Large, $9.75. dis 20@25¢

**Lemon Squeezers.**

Porcelain Lined, No. 1.....₩ doz. $6.00, dis 25&30 %
Wood, No. 2.....₩ doz. $3.00, dis 35 %
Wood, Common.....₩ doz $1.70 @ 1.75
Dunlap's Improved.....₩ doz. $3.75, dis 20 %
Sammis'.....No. 1, $5; 2, $9; 12, $13 ₩ doz. dis 25&10 %
Jennings' "Star".....₩ doz $2.50
The "Boss".....₩ doz $2.50
Dean's.....Nos. 1, ₩ doz $6.50; 2, $5.25; 3, $1.90
Little Giant.....dis 50 @ 50&5 %
King.....dis 40&5 %

**Lines.**

Cotton and Linen Fish, Draper's.....dis 50 %
Draper's Chalk.....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25...dis 25 %
Cotton Chalk.....dis 55 %
Samson, Cotton, No. 4, $2; No. 4½, $2.50.....dis 10 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gross.....dis 40&10 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton.....dis 40
Wire Clothes, No. 18, $3.60; No 19, $3.00; No. 20, $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton.....$7.50 ₩ doz. dis 20%

**Locks. Padlocks. Cabinet Locks. &c.**

*Door Locks, Latches, &c.—*
List, Dec. 30, '86, eff'd Feb. 2, '87...dis 50&10 @ 60&5 %
*Note.*—Lower net prices often made.
Sargent & Co. (list Feb. 1, 1888).....dis 50&10&2 %
Reading Hardware Co. (list Feb. 2, '88). dis 55&60&10 %
Livingston & Co.....dis 70 %
Perkins' Burglar Proof.....dis 60&25 %
Plate.....dis 33⅓&2 %
F. Many's "Extension Cylinder".....$10.50 ₩ doz
Barnes Mfg. Co.....dis 40 %
Yale Corrugated Key.....dis 33⅓ %
Dietz Flat Key.....dis 30 %
L. & C. Round Key Latches.....dis 30&10 %
L. & C. Flat Key Latches.....dis 33⅓&10 %
Romer's Night Latches.....dis 15 %
Yale new list.....dis 33⅓ %
"Shepardson" or "U. S.".....dis 35%
"Feiter" or "American".....dis 40&10 %
Seed's N. Y. Hasp Lock.....dis 25 %

*Cabinet—*
Eagle, Gaylord Parker and Corbin.....} List March, '84, revised Jan. 1, '85. dis 33⅓&2 %
Delts, Nos. 36 to 39.....dis 40 %
Delts, Nos. 51 to 63.....dis 40 &10 %
Dietz, Nos. 86 to 90.....dis 30 %
Stoddard Lock Co.....dis 30 @ 33⅓ %
"Champion" Night Latches.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Eagle and Corbin Trunk.....dis 25&2 %
Champion" Cabinet and Combination....dis 33⅓ %
Yale.....dis 33⅓ %
Romer's.....dis 25 %

*Padlocks—*
List, Dec. 23, 84.....dis 65&10&2@—%
Yale Lock Mfg. Co.'s.....dis 33⅓ %
Eagle.....dis 25&2 %
Eureka, Eagle Lock Co.....dis 40&2 %
Romer's, Nos. 0 to 91.....dis 30 %
Romer's Scandinavian, &c, Nos. 100 to 505...dis 15 %
A. E. Dietz.....dis 40 %
"Champion" Padlocks.....dis 40 %
Hotchkiss.....dis 30 %
"Star".....dis 45 %
"Horse Shoe."₩ dos. $9.....dis 40 %
Barnes Mfg. Co.....dis 40%
Nock's.....dis 30 %
Brown's Patent.....dis 25 %
Scandinavian.....dis90 %
Fraim's Pat. Scandinavian new list (low)....dis 60 %

**Lumber Tools.**

Ring Peavies, "Blue Line" Finish.....₩ doz $20.00
Ring Peaves, Common Finish.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall, Iron Socket Peavies.....₩ doz $19.00
Cant Hooks, "Blue Line" Finish.....₩ doz $16.00
Cant Hooks, Common Finish.....₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....₩ doz $16.00
Cant Hooks, Mall. Socket Clasp Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin.₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish..₩ doz $12.00
Hand Spikes.....₩ doz 6 ft., $15.00; 8 ft., $20
Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft. 20 ft. ₩ doz.....$11.50 12.50 14.50 17.50 21.50
Pike Poles, Pike only, ₩ doz.....10.00 11.00 13.00 16.00 20.00
Pike Poles not Ironed, ₩ doz.....6.00 7.00 9.00 12.00 16.0
Setting Poles, ₩ dos..... 14.00 15.00 17.00 .....
wamp Hooks.....₩ doz $18.00
Landing Blocks.....₩ doz $22.50
Skidding Tongs.....₩ doz $51.00
Log Binders.....₩ doz $26.00
Bended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M, dis 30 %
Square Steel Boot Calks.....dis 40 %
Chain Rafting Dogs.....₩ 100 $12.50
Ring Rafting Dogs...₩ 100, med., $10.00; large, $12.00
Timber Grapples.....₩ doz $30.00

**Lustre.**

Four-ounce Bottles.....₩ dos. $1.75 ₩ gro. $17. 00

**Mallets.**

Hickory.....dis 20&10@20&10&10 %
Lignumvitæ.....dis 20&10@20&10&10 %
B. & L. Block Co, Hickory and L. V...dis 30 @ 30&10 %

**Match Safes.**

Dangerfield's Self-Igniting.....₩ doz $1.25

**Mattocks.**—Regular list.....dis 60&5 @ 60&10 %

**Meat Cutters.**

| Dixon's—Nos. | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| ₩ dos. | $14.00 | 17.00 | 19.00 | 30.00 | dis 45 % |
| Woodruff's | Nos. | 100 | 150 | | |
| | ₩ dos. | $15.00 | 18.00 | dis 45 % | |
| Champion | Nos. | 200 | 300 | 400 | |
| | ₩ dos. | $22.00 | $7.00 | 40.00 | dis 45 % |
| Hales' Pattern | Nos. | 11 | 12 | 13 | |
| | ₩ dos. | $27.00 | 33.00 | 45.00 | } dis 70 @ & 5 % |

American.....dis

| Nos. | 1 | 2 | 3 | 4B | |
|---|---|---|---|---|---|
| Each | $5.00 | 7.00 | 10.00 | 25.00 | 50.00 60.00 |

Enterprise.....dis 70 %

| Nos. | 10 | 12 | 22 | 32 | 42 |
|---|---|---|---|---|---|
| Each | $3. | 2.50 | 4.00 | 6.00 | 17.00 |

Pennsylvania.....dis 40&10%
Nos. 1 2 3 00
₱ doz. $24.00 28.00 36.00 28.00
Miles' Challenge..Nos. 1 2
₱ doz. $22.00 30.00 40.00—d's 45@45&10 %
Home No. 1.....$26 ₱ doz, dis 55&10 %
Draw Cut..Nos. 5 6 8 10
Each...$50.00 75.00 80.00 $35.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)....dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.....₱ doz, $66.00

**Mincing Knives.**
Am. (3d quality), ₱ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....dis 20&10 %
Smith's, ₱ doz, Single, $2.00; Double, $3.....dis 40&45 %
Knapp & Cowles.....dis 50&10@60 %
Buffalo Adjustable.....₱ doz $3.00, dis 25 %

**Molasses Gates.**—Stebbins' Pat..dis 70@70 & 7½ %
Stebbins' Genuine.....dis 60&10&10 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&10 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 66⅔&10 %
Weed's.....dis 20&10 %
Nos. 1 2 3 4
$7.00 8.00 9.00 10.00. ₱ doz, dis 60&10&10 %

**Money Drawers.**—₱ doz., $18 @ $20.

**Muzzles.**—Safety, ₱ doz. $3.....dis 25 %

**Nails**.....See Trade Report
Wire Nails & Brads, list July 14, '87..dis 70@75 & 5 %
Wire Nails, Standard Penny.....₱ keg, $2.80 @ $2.85

**Nail Puller.**—Curtiss Hammer. ₱ doz $9.00 net
Giant, No. 1.....₱ doz $30.00, dis 10 %
Pelican.....₱ doz $9.00, dis 25 %
Boss.....₱ doz $30, dis 30 %

**Nail Sets.**—Square.....₱ gro., $4.00 @ $4.25
Round.....₱ gro., $3.25
Cannon's Diamond Point.....₱ gro. $12 dis 30 %

**Nut Crackers.**
Table (Humason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....₱ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

**Nuts**
Nuts, all kinds, 5¢ off list Jan. 1, 1888.
In lots less than 100 ℔, ₱ ℔, add ½¢, 1 ℔ boxes add 1¢ to list.

**Oakum.**
Government.....₱ ℔ 8½¢
U. S. Navy.....₱ ℔ 7½¢
Navy.....₱ ℔ 6¾¢

**Oilers.**—Zinc and Tin.....dis 65 @ 65&10 %
Brass and Copper.....dis 50&10@50&10&5 %
Malleable, Hammers' Improved, No 1, $3.60; No. 2 $4.00; No. 3, $4.40 ₱ doz.....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list...dis 40 %
Prior's Patent or "Paragon" Zinc.....dis 60&10&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

**Packing, Steam.**

*Rubber—*
Standard.....dis 60&10 @ 60&10&10 %
Extra.....dis 50&10 @ 60 %
N. Y. B. & P. Co., Standard.....dis 50&10&5 %
N. Y. B. & P. Co., Empire.....dis 70 %
N. Y. B. & P. Co., Salamander.....₱ ℔ 65¢, dis 30 %
Jenkins' Standard.....₱ ℔ 80¢, dis 35 %

*Miscellaneous—*
American Packing.....10¢ @ 11¢ ₱ ℔
Russia Packing.....14¢ ₱ ℔
Italian Packing.....13 @ 14¢ ₱ ℔
Cotton Packing.....15 @ 17¢ ₱ ℔
Jute.....7 @ 8¢ ₱ ℔

**Padlocks.**—See Locks.

**Pails.**
*Galvanized Iron—*
Quarts... 10 12 14
Hill's Light Weight, ₱ doz.....$2.75 3.00 3.25
Hill's Heavy Weight, ₱ doz..... 3.00 3.25 3.75
Whiting's..... 2.75 3.00 3.25
Sidney Shepard & Co..... 2.67 ... 3.33
Iron Clad..... 2.75 3.00 3.25
Fire Buckets..... 2.75 3.25 3.50
Buckets, see Wall Buckets

*Indurated Fibre Ware—*
Star Pails, 12 qt.....₱ doz $4.50
Fire, Stable and Milk, 14 qt.....₱ doz $5.50

**Pencils.** Faber's Carpenters.....high list, dis 50 %
Faber's Round Gilt.....₱ gro $5.25 net
Dixon's Lead.....₱ gro $4.50 net
Dixon's [illegible].....₱ gro $0.75 net
Dixon's Carpenters'.....dis 40&10 %

**Picks.**
Railroad, 5 to 6, $12.00; 6 to 7, $13.....dis 60 @ 60&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13.....dis 60 @ 60&10 %

**Picture Nails.**
Brass Head, Sargent's list.....dis 50&10&10 %
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list.....dis 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Niles' Patent.....dis 40 %

**Pinking Irons.**.....₱ doz 65¢ net

**Pipe, Wrought Iron.**—List March 23, 1887.
1¼ and under, Plain.....dis 55 %
1¼ and under, Galvanized.....dis 47½ %
1½ and over, Plain.....dis 65 %
1½ and over, Galvanized.....dis 52½@55 %
Boiler Tubes, Iron.....dis 55 @ 60 %

**Planes and Plane Irons.**
*Wood Planes—*
Molding.....dis 50 @ 50&5 %
Bench, First Quality.....dis 50&10 @ 60 %
Bench, Second Quality.....dis 60&10 %
Bailey's (Stanley R. & L. Co.).....dis 30&10 %
*Iron Planes—*
Bailey's (Stanley R. & L. Co.)...dis 30&10@30&10&5 %
Miscellaneous Planes (Stanley R. & L. Co.)..dis 20&10 %
Victor Planes (Stanley R. & L. Co.).....dis 20& 10 %
Steer's Iron Planes.....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s.....dis 30&10@30&10&10 %
Davis's Iron Planes.....dis 30&10@30&10&10 %
Birmingham Plane Co.....dis 50@50&5 %
Gage Tool Co.'s Self-Setting.....dis 20 %
*Plane Irons—*
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to 2
Plane Irons, Buck Bros.....dis 30 %
Plane Irons, Auburn Tool Co., "Thistle".....dis 40 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron," Single and Cut.....dis 20 @ 25 %
Double.....dis 33⅓ @ 40 %
L. & I. J. White.....dis 25 %

**Pliers and Nippers.**
Button's Patent.....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 6 in., $13.50; No. 4, 7 in., $21.00 ₱ doz dis 20&10@33⅓&5 %
Humason & Beckley Mfg. Co.....dis 50&50&10 %
Gas Pliers.....dis 60 %
Gas Pliers, Custer's Nickel Plated.....dis 60&5 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters.....dis 20 %
Morrill's Parallel, per doz., $12.....dis 30&5 %
Cronk's 8 in., $15; 10 in., $21.....dis 40 %

**Plumbs and Levels.**
Regular List.....dis 70&10@70&10&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10@70&10&10 %
Davis Iron Levels.....dis 30 %
Davis' Inclinometers.....dis 10&10 %

**Poppers, Corn.**
Round or Square, 1 qt.....₱ gro $10.50 @ $12
Round or Square, 2 qt.....₱ gro $23.50 @ $24

**Post Hole and Tree Augers and Diggers.**
Samson Post Hole Digger.....₱ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.....₱ doz $36.00, dis 20 %
Eureka Diggers.....₱ doz $16 @ $17
Leed's.....₱ doz $8.00 @ $9.00
Vaughan's Post Hole, Auger, per doz....$13 00 @ $14.00
Kohler's Little Giant.....₱ doz $18.00
Kohler's Hercules.....₱ doz $15.00
Kohler's New Champion.....₱ doz $9.00
Schneidler.....₱ doz $18
Ryan's Post Hole Diggers.....₱ doz $24
Cronk's Post Bars.....doz $60, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, ₱ doz $30....d's 40 @ 40&10 %

**Potato Parers.**
White Mountain.....₱ doz $5.00 @ 5.50
Antrim Combination.....₱ doz $8.00
Hoosier.....₱ doz $13.50

**Pruning Hooks and Shears.**
Disston's Combined Pruning Hook and Saw, ₱ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₱ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools.....dis 40 %
Pruning Shears, Henry Pat...₱ doz $3.75 @ $4.00 net
Henry's Pruning Shears.....₱ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...₱ doz $12, dis 20 %
Dunlap's Saw and Chisel.....₱ doz $8.50, dis 30 %
J. Mallinson & Co.....No. 1, $5.25; No. 2, $7.25

**Pulleys.**—Hot House, Awning, &c.....dis 60&10 %
Japanned Screw.....dis 60&10 %
Brass Screw.....dis 60&10 %
Japanned Side.....dis 60&10 %
Japanned Clothes Line.....dis 60&10 %
Empire Sash Pulley.....dis 55 @ 60 %
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 } dis 50&10 @ 50&10&5 %
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....dis 50 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 20 %
Hay Fork, Reed's Self-Lubricating.....dis 60 %
Spade Eyes.....dis 45 %
Tackle Blocks.....See Blocks

**Pumps.**—Cistern, Best Makers.....dis 50 @ 10&60 %
Pitcher Spout, Best Makers...dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods..dis 70&5 @ 70&10&5 %

**Punches.**
Saddlers' or Drive, good quality.....₱ doz 60¢ @ 65¢
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality.....₱ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₱ doz $1.44, dis 55 %
Tinners' Hollow Punches.....dis 30&5 %
Rice Hand Punches.....dis 15 %

**Rail.**
Sliding Door, Wrt. Brass ₱ ℔ 35¢.....dis 15 %
Sliding Door, Bronzed Wrt. Iron.....₱ foot 7¢
Sliding Door Iron, Painted....₱ foot 4¢, dis 20&10&5 %
Barn Door, Light....Inch. ½ ¾
Per 100 feet..... $2.50 3.00 4.40—dis 10 %
3 ℔ for N. E. Hangers—
Small. Med. Large
Per 100 feet..... $2.15 2.70 3.25 net
Terry's Wrought Iron, ₱ foot.....4½¢ @ 5¢
Victor Track Rail 7¢ ₱ foot.....dis 50&2 %
Carrier Steel Rail, per foot.....4½¢

**Rakes.**
Cast Steel.....dis 65&5 @ 70 %
Malleable.....dis 70 @ 70&5 %
Gibbs Lawn Rake.....$12, dis 40 %
Canton Lawn Rake.....dis 40 %
Ft. Madison Prize Bow Brace and Peerless..dis 65&5 %
Fort Madison Steel Tooth Lawn Rake, $6.....dis 25 %

**Razors.**—J. R. Torrey Razor Co.....dis 20%
Wostenholme and Butcher.....$10 to $, dis 10 %

**Razor Strops.**
Genuine Emerson.....dis 60 @ 60&5 %
Imitation Emerson.....₱ doz $2.00, dis 20&10&5 %
Torrey's.....dis 20 %
Badger's Belt and Combination.....₱ doz $2
Lamont Combination.....₱ doz $4

**Rivets and Burrs.**
Copper.....dis 50, with Jobbers' Extras.
Iron, list November 17, 1887.....dis 50 %

**Rivet Sets.**.....dis 50&2 @ 50&10 %

**Rods.**—Stair, Brass.....dis 20&2 %
Stair, Black Walnut.....₱ doz 40¢

**Rollers.**
Barn Door, Sargent's list,.....dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

**Rope.**—Manufacturers' prices for large lots.
Manila.....⅝ inch and larger ₱ ℔ 10¢ net
Manila.....⅜ inch ₱ ℔ 11¢ net
Manila.....¼ and 5-16 inch ₱ ℔ 13¢ net
Manila Tarred Rope.....₱ ℔ 10¢ net
Manila, Hay Rope.....₱ ℔ 10¢ net
Sisal.....½ inch and larger ₱ ℔ 9½¢ net
Sisal.....⅜ inch ₱ ℔ 9¾¢ net
Sisal.....¼ and 5-16 inch ₱ ℔ 10¼¢ net
Sisal, Hay Rope.....₱ ℔ 9½¢ net
Sisal, Tarred Rope.....₱ ℔ 8½¢ net
Sisal, Medium Lath Yarn.....₱ ℔ 8½¢ net
Cotton Rope.....₱ ℔ 15 @ 18¢ net
Jute Rope.....₱ ℔ 7¢
Dis 1½ % for cash in 10 days.

**Rules.**
Boxwood.....dis 80&10 @ 80&10&10 %
Ivory.....dis 50 @ 55&10 %

**Sad Irons.**
From 4 to 10, at factory.....₱ 100 ℔ $2.75 @ $2.85
Self-Heating.....₱ doz. $9.00 net
Self-Heating, Tailors'.....₱ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons.....dis 40@40&5 %
Enterprise Star Irons, new list, July 20, 1883....dis 40 %
Combined Fluter and Sad Iron...₱ doz. $15.00, dis 15 %
Fox Reversible, Self-Fluter.....₱ doz., $24.00 net
Chinese Laundry (N. E. Butt Co.).....$1¢, dis 15 %
New England.....5¢, dis 15 %
Mahony's Troy Pol. Irons.....dis 25 %

**Sand and Emery Paper and Cloth.**
List April 19, 1886.....dis 20@20&5 %
Sibley's Emery and Crocus Cloth.....dis 30 %

**Sash Cord.**
Common.....₱ ℔, 10¢ @ 11¢
Patent, good quality.....₱ ℔, 12¢ @ 13½¢
White Cotton Braided, fair quality.....₱ ℔ 28¢ @ 29¢
Common Penaia Sash.....₱ ℔ 13½¢
Patent " " .....₱ ℔ 15¢
Cable Laid Italian " .....₱ ℔ 22¢ @ 23¢
India Cable Laid " .....₱ ℔ 13¢
Silver Lake, A Quality, White.....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5 %
Silver Lake, B Quality, White.....50¢, dis 20&10&5 %
Silver Lake, B Quality Drab.....55¢, dis 20&10&5 %
Silver Lake, C Quality, White (only).....27¢ @ 28¢
Sylvan Spring, Extra Braided, White.....34¢
Sylvan Spring, Extra Braided, Drab.....39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton....50¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton.....55¢ dis 30 @ 30&5 %
Samson, Braided Italian Hemp....55¢ dis 30 @ 30&5 %
Samson Braided Linen.....80¢ dis 30 @ 30&5 %

**Sash Locks.**
Clark's No. 1, $10.00; No. 2, $8.00 ₱ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886.....dis 60&2 %
Victor.....60&10&2 %
Walker.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Reading.....dis 66⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs.....dis 40 %
Common Sense, Jap'd, Cop'd and Br'zed..₱ gross $4.50
Common Sense, Nickel Plated.....₱ gross $10.00
Universal.....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60&10&2 %
Corbin's Daisy, list February 16, 1886.....dis 70 %
Payson's Perfect.....dis 60 @ 60&10 %
Hugunin's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&2&2 %
Hugunin's New Sash Locks, list Jan. 5, '87..dis 25&5&2 %
Stoddard "Practical".....dis 10 %
Ives Patent.....dis 60 %
Lieschе's Nos. 100 & 110 ₱ gro. $8 · 105, $10..dis 20&10 %
Davis, Bronze, Barnes Mfg. Co.....dis 50 %
Champion Safety, List March 1, 1888....dis 55@55&5 %

**Sash Weights.**
Solid Eyes.....₱ ton. $25

**Sausage Stuffers or Fillers.**
Miles' "Challenge".....₱ doz. $20, dis 50@50&5 %
Perry.....₱ doz. No. 1, $15; No. 0, $21, dis 50@50&5 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Oliver's.....dis 40&10 %

**Saws.**
Disston's Circular....dis 45@45&5 %} Extras some-
Disston's Cross Cuts..d's 45@45&5 %} times given by
Disston's Hand.....dis 25@25&5 %} jobbers.
Atkins' Circular.....dis 50 %
Atkins' Silver Steel Diamond X Cuts.....₱ foot 70¢
Atkins' Special Steel Dexter X Cuts.....₱ foot 50¢
Atkins' Special Steel Diamond X Cuts.....₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₱ foot 27 @ 28¢
Atkins' Hollow Back X Cuts.....₱ foot 18¢
Atkins' Shingle, Mulay, Drag, &c.....dis 45 %
W. M. & C., Hand.....dis 30&5 @ 30&10 %
W. M. & C. Champion X Cuts. Regular ₱ foot .24¢@26¢
W. M. & C. X Cuts. Thin Back.....₱ foot 27¢@29¢
Peace Circular and Mill.....dis 45&10 %
Peace Hand Panel and Rip....dis 20&10 @ 20&10&10 %
Peace Cross Cuts, Standard.....₱ foot 25¢
Peace Cross Cuts, Thin Back.....₱ foot 27¢@28¢
Richardson's Circular and Mill.....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢
*Hack Saws—*
Griffin's Hack Saws, complete.....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50 %
Star Hack Saws and Blades.....dis 25 %
Diamond Hack Saws and Blades.....dis 25 %
Eureka and Crescent.....dis 25 %

**Saw Frames.**
White Vermont.....₱ gro $9 @ $10
Red, Polished, and Varnished....₱ doz $1.50, dis 25 %

**Saw Sets.**
Stillman's Genuine....₱ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imita..₱ doz $3.25 and $5.25, dis 40&5@40&10%
Common Lever.....₱ doz $2.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 & 4, $24....dis 40&10@50%
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's.....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 55&5 %
Hart's Patent Lever.....dis 20 %
Disston's, Star, ₱. No. 15, $5.50, dis 20&10@30&10&10 %
Atkins' Lever.....per doz No. 1, $6.00; No. 2, $9.60
Atkins' Criterion.....per doz $7.00 @ $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00, dis 33⅓&10 %

**Saw Tools.**
Atkins Perfection.... $15.00; Excelsior $6.00 ₱ doz

**Scales.**
Hatch, Counter, No. 171, good quality.....₱ doz $21
Hatch, Tea, No. 161.....₱ doz $6.75 @ $7.00
Union Platform, Plain.....$2.30 @ 2.35
Union Platform, Striped.....$2.40 @ 2.50
Chatillon's Grocers' Trip Scales.....dis 50 %
Chatillon's Eureka.....dis 25 %
Chatillon's Favorite.....dis 40 %
Family, Turnbull's.....dis 30@30&10 %

**Scale Beams.**
Scale Beams, List of Jan. 12, 82..dis 50&10@50&10&5 %
Scale Beams, Custer.....dis 30@33⅓ %
Chatillon's No. 1.....dis 40 %
Chatillon's No. 2.....dis 50 %

**Scrapers.**
Adjustable Box Scraper (S. R. & L. Co.)..$6.50, dis 30&10 %
Box, 1 Handle.....₱ doz $4.00, dis 10 %
Box, 2 Handle.....₱ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 30&10 %
Foot.....dis 50&10@60 %
Ship, Common.....₱ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

**Screen Window and Door Frames.**
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons, Warner's....dis 33⅓ @ 33⅓&10 %
Stearns' Frames and Corners.....dis 25 @ 25&10 %

**Screw Drivers.**
Douglas Mfg Co.....dis 20&10&10 %
Disstons.....dis 45&10 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 65&10 %
Stanley R. & L. Co.'s Black Handles.....dis 60&10 %
Sargent & Co.'s No. 1 Forged Blade.....dis 70&10&10 %
Sargent & Co.'s No. 20.....dis 66⅔&10&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel.....dis 60&10 %
Sargent & Co.'s No. 60, Round Blade.....dis 70&10 %
Knapp & Cowles' No. 1.....dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra.....dis 60 @ 60&10 %
Knapp & Cowles' No. 00 & 4....dis 50&5 @ 50&10 %
Stearns'.....dis 25&10&5 %
Gay & Parsons.....dis 35 %
Champion.....dis 25 %
Clark's Patent.....dis 30 @ 33⅓ %
Crawford's Adjustable.....dis 30 %
Ellrich's Socket and Ratchet.....dis 25 @ 25&10 %
Allard's Spiral, new list.....dis 25 %
Kolb's Common Sense.....₱ doz $6, dis 25&10 %

Syracuse Screw-Driver Bits.....dis 30 & 30&5 %
Screw Driver Bits.....₩ doz. 50¢ @ 75¢
Screw Driver Bits, Parr's.....₩ gro. 6.25
Fray's Hol. Hdle. Sets, No. 3, $12.....dis. 25 @ 25 & 10 %
P. D. & Co.'s, all Steel.....dis 50 %

**Screws.**
*Wood Screws*—List, Brass, Jan 27; Iron, July 1, 1887
Flat Head Iron.....dis 70 %
Round Head Iron.....dis 65 %
Flat Head Brass.....dis 65 %
Round Head Brass.....dis 60 %
Flat Head Bronze.....dis 65 %
Round Head Bronze.....dis 60 %
} Ex. 10 % often given by jobbers.
*Machine*—
Flat Head, Iron.....dis 55 %
Round Head, Iron.....dis 50 %
*Bench and Hand*—
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %
Lag, Blunt Point.....dis 70 %
Coach and Lag, Gimlet Point.....dis 66⅔@66⅔&5 %
Bed.....dis 25&5 %
Hand Rail, Sargent's.....dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co's.....dis 70&10&75 %
Hand Rail, Am. Screw Co.....dis 75 %
Jack Screws, Millers Falls List.....dis 50 @ 50&5 %
Jack Screws, P. S. & W.....dis 35 %
Jack Screws, Sargent.....dis 60&10 @ 60&10&5 %
Jack Screws, Stearns.....dis 40 @ 40&10 %

**Scroll Saws.**
Lester, complete, $10.00.....dis 25 %
Rogers, complete, $4.00.....dis 25 %

**Scythe Snaths.**.....dis 50&10 %

**Shears.**
American (Cast) Iron.....dis 75&10 @ 75&10&5 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ doz $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec. 1881.dis 60&10&10@60&10&10&5 %
Heinsch's, List, Dec. 1881.dis 60&10&10@60&10&10&5 %
Heinsch's Tailor's Shears.....dis 33⅓ %
First quality C. S. Trimmers.....dis 80@80&10 %
Second quality C. S. Trimmers.dis 80&10@80&10&10 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10@75&10&5 %
Howe Bros. & Hulbert. Solid Forged Steel..dis 40 %
Cleveland Machine Co., Solid Steel Forged.....dis 70 %

**Sheaves.**
*Sliding Door*—
M. W. & Co., list Jan. 1, 1887.dis 50&10 @ 60&5 %
R. & E., list Dec. 18, 1885.....dis 55&2 %
Corbin's list.....dis 60&10&2 %
Patent Roller.....dis 60&10&2 %
Patent Roller, Hatfield's.....dis 75 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2
Moore's Anti-Friction.....dis 60
*Sliding Shutter*—
R. & E. list Dec. 18, 1885.....dis 60&10&2 %
Sargent's list.....dis 60&10 %
Reading list.....dis 60&10&10 %

**Ship Tools.**
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %

**Shoes, Horse, Mule, &c.**
*Horse*—
Burden's, Perkins', Phœnix, at factory.....$4.00
*Mule*—Add $1 ₩ keg to above prices.
*Ox, Wrought*—
Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

**Shot.**—*(Eastern prices, 2¢ off, cash, 5 days.)*
Drop, ₩ bag, 25 ℔.....$1.50
Drop, ₩ bag, 5 ℔.....35
Buck and Chilled, ₩ 25-℔ bag.....$1.75
Buck and Chilled; ₩ 5-℔ bag.....40

**Shovels and Spades.**
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....dis 30 %
NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.
Griffith's Black Iron.....dis 50&10 %
Griffith's C. S.....dis 60 @ 60&10 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony (Sanford Fork & Tool Co).....dis 20 %
St. Louis Shovel Co.....dis 15 @ 15&7½ %
Hussey, Binns & Co.....dis 15 @ 25 %
Hubbard & Co.....dis 20@20&7½ %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list January, 1886.....dis 30 %
Remington's (Lowman's Patent), .....dis 30&10 @ 40 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel .....dis 60&5 @ 60&10 %

**Shovels and Tents.**
Iron Head.....dis 60&10@60&10&5 %
Brass Head.....dis 60&10&10 %

**Skeins. Thimble.**
Western list.....dis 75&5 @ 75&10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20 %
Coldbrookdale Iron Co .....dis 50&10 %

**Sieves.**
Buffalo Metallic. S. S. & Co., new list..dis 50&25&10 %
Barler Flour Sifters.....₩ doz $2.00
Smith's Adjustable Sifters.....₩ doz $2.25
Smith's Adjustable Milk Strainer.....₩ doz $2.00
Smith's Adjustable F. & C. Strainer.....₩ doz $1.75
*Sieves, Wooden Rim*—

| | Iron. | Plated. |
|---|---|---|
| Mesh 18, Nested. ₩ doz. | 70¢ | 90¢ |
| Mesh 20, Nested, ₩ doz. | 85¢ | $1.00 |
| Mesh 24, Nested, ₩ doz. | $1.00 | 1.10 |

**Slates.**—School, by case.....dis 50&10 %

**Snaps, Harness, &c.**
Anchor (T. & S. Mfg Co.).....dis 65 %
Fitch's (Bristol).....dis 50&10 %
Hotchkiss.....dis 10 %
Andrews.....dis 50 %
Sargent's Patent Guarded .....dis 70&10&10 %
German, new list.....dis 40&10 %
Covert.....dis 50&2 %
Covert, New Patent.....dis 50&5&2 %
Covert New R. E.....dis 60&2 %
Covered Spring.....dis 60&10&10 %

**Soldering Irons.**
Covert's Adjustable. list Jan. 1, 1886.....dis 35&2 %

**Spoke Shaves.**—Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 20&10 @ 30 %

**Spoke Trimmers.**
Bonney's.....₩ doz $10.00, dis 50 %
Stearns'.....dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 55&10 %
Douglass'.....₩ doz $9.00, dis 20 %

**Spoons and Forks.**
*Tinned Iron*—
Basting, Central Stamping Co.'s list. dis 70@76&10 %
Solid Table and Tea, Central Stamping Company's list.....dis 70@70&10 %
Buffalo, S. S. & Co.....dis 33⅓&2 %
*Silver-Plated*—4 mos. or 5 % cash 30 days.
Meriden Brit. Co., Rogers.....dis 50 %
C. Rogers & Bros.....dis 50 %
Rogers & Bro.....50 %
Reed & Barton.....dis 50 %
Wm. Rogers Mfg. Co.....dis 50 @ 50&10 %
Simpson, Hall, Miller & Co.....dis 50 @ 50&10 %
Holmes & Edwards Silver Co.....dis 50 @ 50&10 %
H. & E. Silver Co. Mexican Silver.....dis 50&5 %
H. & E. Silver Co., Durham Silver .....dis 50&5 %
German Silver.....dis 50 @ 50&5 %
German Silver, Hall & Elton.....dis 40&5 %
Nickel Silver.....dis 50&5@50&10&5 %, cash
Britannia.....dis 55 %

**Springs.**
Elliptic. Concord, Platform and Half Scroll.....dis 60 @ 60&5 %
Cliff's Bolster Springs .....dis 25 %

**Squares.**
Steel and Iron.....
Nickel Plated.....
} .....dis 70 @ 70&10 %
Try Square and T Bevels.....dis 60&10&10 @ 70 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter.....dis 30&10 %

**Staples.**
Fence Staples, Galvanized } Same price as Barb Wire.
Fence Staples, Plain..... } See Trade Report.

**Steelyards.**.....dis 40&10@50&5 %

**Stocks and Dies.**
Blacksmith's, Waterford Goods ....dis 30&5 @ 30&10 %
Lightning Screw Plate.....dis 25 @ 30 %
Reece's New Screw Plates.....dis 33⅓ @ 33⅓&5 %

**Stone.**
Hindostan No. 1, 3¢; Axe, 5½¢; Slips No. 1, 5¢..
Sand Stone.....₩ ℔, 2¢
Washita Stone, Extra.....₩ ℔, 2 1 @ 22¢
Washita Stone, No. 1.....₩ ℔, 15 @ 16¢
Washita Stone, No. 2.....₩ ℔, 11 @ 12¢
Washita Slips, No. 1. Extra.....₩ ℔, 40 @ 42¢
Washita Slips, No. 1.....₩ ℔, 30 @ 32¢
Arkansas Stone, No. 1, 4 to 6 in.....₩ ℔, $1.35
Arkansas Stone, No. 1, 6 to 9 in.....₩ ℔, $1.75
Turkey Oil Stone.....4 to 8 in., ₩ ℔, 40¢
Turkey Slips.....₩ ℔, $1.00 @ $1.50
Lake Superior, Chase.....₩ ℔, 16¢
Lake Superior Slips, Chase.....₩ ℔, 31@32¢
Seneca Stone, Red Paper Brand, ₩ ℔.....18 @ 20¢
Seneca Stone, High Rounds, ₩ ℔.....20 @ 25¢
Seneca Stone, Small Whets, ₩ gro.....$24.00

**Stove Polish.**
Joseph Dixon s.....₩ gro $6.00, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis —%
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun, 5 gro. lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢ net
Boynton's Noon Day. ₩ gro. .....$5.00
Parlor Pride Stove Enamel.....₩ gross, $13
Yates' Liquid, 2 3 5 10 gal. cans
₩ gal.. $0.90 .80 .70 .60
Yates Standard Paste Polish, 10-lb cans, per lb., 15 ¢
Jet Black.....₩ gro $3.50
Japanese .....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K Enamel.....₩ gro $19.00

**Tacks, Brads, &c.**
List, Jan. 2. 1888.
American Iron Carpet Tacks.....dis 72½&10&2 %
Steel Carpet Tacks.....dis 72½&10&2 %
Swedes Iron Carpet Tacks.....dis 72½&10&2 %
American Iron Cut Tacks.....dis 70&10&2 %
Swedes Iron Tacks .....dis 67½&10&2 %
Swedes Iron Upholsterers' Tacks...dis 67½&10&2 %
Tinned Swedes Iron Tacks.....dis 67½&10& %
Tin'd Sw'des Iron Uphol'ers' Tacks.dis 67½&10&2 %
Gimp and Lace Tacks.....dis 67½&10&2 %
Tinned Gimp and Lace Tacks.....dis 67½&10&2 %
Swedes Iron Trimmers' Tacks ....dis 67½&10&2 %
Swedes Iron Miners' Tacks .....dis 67½&10&2 %
Swedes Iron Bill Posters' or Railroad Tacks.....dis 67½&10&2 %
Swedes Steel Tacks, all kinds (Swedes Iron price list).....dis 72½&10&2 %
Copper Tacks.....dis 3⅓&10&2 %
Copper Finishing Trunk and Clout Nails.....dis 33⅓&10&2 %
Finishing Nails .....dis 60&10&2 %
Trunk and Clout Nails .....dis 60&10&2 %
Tinned Trunk and Clout Nails.....dis 60&10&2 %
Tinned Nails.....dis 60&10&2 %
Common and Patent Brads.....dis 60&10&2 %
Hungarian Nails.....dis 60&10&2 %
Chair Nails.....dis 60&10&2 %
Zinc Glaizers' Points.....dis 40&10&2 %
Cigar Box Nails .....dis 45&10&2 %
Picture-Frame Points.....dis 45&10&2 %
Looking-Glass Tacks.....dis 45&10&2 %
Leathered Carpet Tacks.....dis 45&10&2 %
Brush Tacks.....dis 45&10&2 %
Shoe Finders'.....List Jan. 2, 1888. dis 10 @ 10&5 %
Lining and Saddle Nails, List Jan. 1, 1880:
Silvered.....dis 30&10&10 %
Japanned.....dis 20&10&10 %
Double-pointed Tacks.....85 %
Wire Carpet Nails .....dis 50&10 %
Wire Brads and Nails.....See Nails, Wire
Steel Wire Brads, R. & E. Mfg. Co.'s list....dis 50&10 %

**Tap Borers.**
Common and Ring .....dis 20&10 %
Ives' Tap Borers.....dis 33⅓&5 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Clark's.....dis 33⅓ @ 35 %

**Tapes, Measuring.**—American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 @ 30 %

**Thermometers.**—Tin Case.....dis 30 @ 30&10 %

**Thimble Skeins.**—See Skeins.

**Ties, Bale.**
Steel Wire, Standard list .....dis 50&10&5 %

**Tinners' Shears, &c.**
Shears and Snips (P. S. & W.).....dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co.....dis 33⅓%

**Tinware.**
Stamped, Japanned & Pieced, list Jan. 20, 1887.....dis 70 @ 70&10&5 %

**Tire Benders, Upsetters, &c.**
Stoddard's Lightning Tire Upsetters.....dis 15 %
Detroit Perfected Tire Bender.....dis 15 %

**Tobacco Cutters.**
Enterprise Mfg. Co. (Champion).....dis 20&10 @ 30 %
Wood Bottom.....₩ doz $5.00 @ $5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s.....₩ doz $18.00, dis 50 @ 55 %
Wilson's.....dis 55 %
Clipper (Sargent & Co.).....₩ doz $24, dis 50&10&10 %
Acme.....₩ doz $20.00, dis 40 %

**Transom Lifters**
Wollensak's Patent Iron Bronzed.....dis 50 %
Reither's bronzed Iron Rods list Jan. 1, 1887.dis 50&2 %
Reiher's Real Bronze or Nickel Plate. list Jan. 1, 1887.....dis 50&2 %
Excelsior.....dis 50&10&2 %
Shaw's.....dis 50&10 %
Payson's Universal.....dis 40 @ 40&10 %
Crown and Star.....dis 60 %

**Traps.**
*Game*—
Newhouse.....dis 35 @ 40&5 %
Kneidir, Pattern.....dis 60&10&10 @ 70 %
Game, Blake's Patent.....dis 40&10&5 %
*Mouse and Rat*—
Mouse, Wood. Choker.....₩ doz holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50, dis 10 %
Mouse, Cage, Wire.....₩ doz $2.50, dis 10 %
Mouse, Catch-'em-alive.....₩ doz $2.50, dis 15
Mouse, "Bonanza".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 15 %
Rat, "Decoy".....₩ gross $10.00, dis 10 %

Extra 10 % generally given.

Ideal.....₩ gross $10
Cyclone.....₩ gross $5.25
Hotchkiss Metallic Mouse, 5-hole traps.....₩ doz 90¢
In full cases.....₩ doz 75¢

**Trowels.**
Lothrop's Brick and Plastering.....dis 25
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 25 @ 25&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 @ 20 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20
Garden.....dis 70 %

**Triers.**—Butter and Cheese.....dis 25 %

**Trucks, Warehouse, &c.**
B. & L. Block Co.'s list, 1882.....dis 40 %

**Tubes, Boiler.**—See Pipe

**Twine.**

| | BC. | B. |
|---|---|---|
| No. 9, Flax Twine, ¼ and ½ ℔ Balls | 22¢ | 30¢ .. |
| No. 12, " " ¼ and ½ " | 21¢ | 29¢ .. |
| No. 18, " " ¼ and ½ " | 18¢ | 28¢ .. |
| No. 24, " " ¼ and ½ " | 18¢ | 28¢ .. |
| No. 36, " " ¼ and ½ " | 16¢ | 27¢ .. |
| No. 264, Mattrass, ¼ and ½ " | 48 @ 50¢ | |
| Chalk Line, Cotton, ½ ℔ Balls | 25¢ | |
| Mason Line, Linen, ½ " | 55¢ | |
| 2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine) | 11½¢ | |
| 3-Ply Hemp, 1 ℔ Balls | 12 @ 13½¢ | |
| 3-Ply Hemp, 1½ ℔ Balls | 11 @ 11½¢ | |
| Cotton Wrapping, 5 Balls to ℔ | 15¢ @ 16¢ | |
| 2, 3, 4 and 5 Ply Jute, ¼ ℔ Balls | 10¢ | |
| Wool | 6½¢ @ 6¾¢ | |
| Paper | 13¢ @ 14¢ | |
| Cotton Mops—6, 9, 12 and 15 ℔ to doz. | 18¢ | |

**Vises.**
Solid Box.....dis 50&10&5 @ 60 %
*Parallel*—
Fisher & Norris Double Screw.....dis 15&10 %
Stephens'.....dis 25 %
Parker's.....dis 20 @ 25 %
Wilson's.....dis 55 %
Howard's.....dis 40 %
Bonney's.....dis 40%
Millers Falls.....dis 40 @ 40&10 %
Trenton.....dis 40&5 @ 40&10 %
Merrill's.....dis 15@20 %
Sargent's.....dis 60&10&10 %
Backus and Union.....dis 40 %
Double Screw Lez.....dis 15&10 %
Prentiss.....dis 20&5 @ 25 %
Simpson's Adjustable.....dis 40 %
*Saw Filers*—
Bonney's, Nos. 2 & 3.....₩ doz $15.00, dis 40 %
Stearn's.....dis 33⅓&10 @ 33⅓&10&10 %
Stearn's Silent Saw Vises.....dis 33⅓ @ 35 %
Sargent's.....dis 60&10&10 %
Hopkins'.....₩ doz $17.50, dis 10 %
Reading.....dis 40&10 %
Wentworth.....dis 20&10 %
Combination Hand Vise.....₩ gro, $42.00
Cowell Hand Vises.....dis 20 %
Bauer's Pipe Vises.....dis 10 %

**Wagon Boxes.**
Per lb.....3½¢

**Washer Cutters.**
Smith's Patent.....₩ doz $12.00, dis 40&10&10 %
Johnson's.....₩ doz $11.00, dis 33⅓ %
Penny's .....₩ doz Pol. $14; Jap'd, $16..dis 55 %
Appleton's .....₩ doz $16.00, dis 60&10 %
Bonney's .....dis 30&10 %

**Washers.**

| Size | ¼ | 5-16 | ⅜ | ½ | ⅝ | ¾ | ⅞ | 1 |
|---|---|---|---|---|---|---|---|---|
| Washers | 7 | 5¾ | 4¾ | 4 | 3½ | 3⅓ | 3⅛ | |

In lots less than 100 ℔, ₩ ℔, add ½¢, 1-℔ boxes 1¢ to list.

**Wedges.**—Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

**Well Buckets, Galvanized.**
Hill's.....₩ doz ..12 qt., $4.25; 14 qt., $5.25
Iron Clad.....₩ doz., 14 qt., $4.25 @ $4.50
Whiting's Flat Iron Band.....₩ doz $4.25 @ $4.50
Whiting's Wired Top.....₩ doz $4.00 @ $4.25

**Well Wheels**—8 in., $2.25; 10 in., $2.70; 12 in., $3.25.

**Wire.**
*Iron*—
Market. Br. & Ann., Nos. 0 to 18.....dis 75@75&5 %
Market. Copp'red. Nos. 0 to 18 .....dis 70&10@75 %
Market, Galvanized, Nos. 0 to 18.....dis 65&10@70 %
Market. Tin'd. Tinned list Nos. 0 to 18.....dis 67½@67½&5 %
Stone Br. & Ann'd, Nos. 16 to 18.....dis 72½&5@75 %
Stone, Bright & Ann'd, Nos. 19 to 26.dis 75&5@75&10 %
Stone. Br. & Ann'd, Nos. 27 to 36...dis 75&10&5@80 %
Stone, Tin'd, Tin'd list, Nos. 18 to 36...dis 70&10@75 %
Tinned Broom Wire, Nos. 18 to 24.....dis 72½@75 %
Galvanized Fence.....dis 65@65&5 %
Annealed Fence, Nos. 8 & 9.....dis 75@75&5 %
Annealed Grape, Nos. 10 to 14.....dis 75@75&5 %
Brass and Copper, list, Jan. 18, '84.....dis 15 @ 20 %
Barb Fence.....See Trade Report
Wire on Spools .....dis 65 %
Malin's Steel and Tinned Wire on Spools.....dis 50 %
Malin's Brass and Copper Wire on Spools.....dis 40 %
Cast Steel Wire.....dis 50 %
Stubs' Steel Wire.....$6.00 to 2, dis 30 %
Steel Music Wire, Nos. 12 to 30.....55¢ ₩ ℔
Picture Wire.....dis 60&10 %
Barb Wire Safety Guards.....₩ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines.

**Wire Cloth, Netting, &c.**
Painted Screen Cloth, No. 34, ₩ 100 sq ft.....$1.90
Painted Screen Cloth, No 33, ₩ 100 sq. ft .....$2.00
Galvanized Wire Netting.....dis 70&10 @ 75 %

**Wire Goods.**—See Bright Wire Goods.

**Wire Rope.**—List May 1, 1886.....dis 33⅓ %

**Wrenches.**—American Adjustable.....dis 40 %
Baxter's Adjustable "S".....dis 35&10 %
Baxter's Diagonal.....dis 40 @ 40&10
Coes' Genuine.....dis 55&3 %
Coes' "Mechanics'".....dis 55&10&3 %
Girard Standard.....dis 70&10 %
Lamson & Sessions' Engineers'.....dis 60&10 %
Lamson & Sessions' Standard .....dis 70&10 %
Coes' Pattern, Wrought.. } .....dis 80 @ 80&5 %
Girard Agricultural..... }
Lamson & Sessions' Agricultural.. }
Sterling Wrought..... }
Bemis & Call's Patent Combination.....dis 35 %
Bemis & Call's Merrick's Pattern.....dis 35 %
Bemis & Call's Brigg's Patte.....dis 35 %
Bemis & Call's Cylinder or Gas Pipe .....dis 40&5 %
Remis & Call's No. 3 Pipe.....dis 35&5 %
Aiken's Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₩ doz $4.00, dis 40%
Webster's Patent Combination.....dis 25 %
Boardman's.....dis 25&25&10 %
Always Ready.....dis 25&5 %
Alligator.....dis 50 %
Donohue's Engineer.....dis 25 %
Acme. Bright.....dis 60&3 %
Acme, Nickeled.....dis 50&3 %
Walker s.....dis 55&3 %
Diamond.....dis 40 %
Diamond Patent Steel .....dis 40 %

**Wringers, Clothes.**
List Jan. 10, 1888, $3.00 off.

**Wrought Goods.**
Staples Hooks, &c., list Jan. 12, '87.dis 80&20@50&25 %

# CURRENT METAL PRICES.

## MAY 16, 1888.

### IRON AND STEEL.

#### Bar Iron from Store.

Common Iron :
¾ to 2 in. round and square.. ₩ lb 1.95 @ 2.05¢
1 to 6 in. x ⅜ to 1 in..... ₩ lb 1.95 @ 2.05¢
Refined Iron :
¾ to 2 in. round and square.. ₩ lb 2.15 @ 2.25¢
1 to 4 in. x ⅜ to 1½ in..... ₩ lb 2.15 @ 2.25¢
4½ to 6 in. x ⅜ to 1 in..... ₩ lb 2.15 @ 2.25¢
1 to 6 in. x ¼ and 5-16 ..... ₩ lb 2.35 @ 2.45¢
Rods—⅜ and 11-16 round and sq.. ₩ lb 2.25 @ 2.35¢
Bands—1 to 6 x 3-16 to No. 12..... ₩ lb 2.35 @ 2.45¢
"Burden Best" Iron, base price.. ₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price..... ₩ lb 2.80 @ ....¢
"Ulster"..... lb 3.10 @ ....¢
Norway Rods ..... 4.00 @ 5.00¢

#### Merchant Steel from Store.

Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots..... 2¾¢ @ 3¢
Best Cast Steel, base price in small lots 9¢ @ 10¢
Best Cast Steel Machinery, base price in small lots..... 5½¢ @ 6¢

#### Extras on Merchant Steel.

For classification and extras adopted by the Merchant Steel Association of the United States January 11, 1888, see *The Iron Age*, Feb. 23, 1888.

#### Sheet Iron from Store.

| | Common American. | | R. G. | Cleaned. |
|---|---|---|---|---|
| 10 to 16 | ₩ lb 2.75 | @ 2.80¢ | 3.25 | @ ....¢ |
| 17 to 20 | ₩ lb 2.85 | @ 3.00¢ | 3.25 | @ 3.50 ¢ |
| 21 to 24 | ₩ lb 3.00 | @ 3.10¢ | 3.50 | @ ....¢ |
| 25 and 26 | ₩ lb 3.20 | @ ....¢ | 3.75 | @ ....¢ |
| 27 | ₩ lb 3.75 | @ 3.87½¢ | 4.00 | @ ....¢ |
| 28 | ₩ lb 3.50 | @ ....¢ | 4.00 | @ ....¢ |

| | B. B. | 2d qual. |
|---|---|---|
| Galvanized, 14 to 20 | ₩ lb 4.80¢ | 4.50 ¢ |
| Galvanized, 21 to 24 | ₩ lb 5.20¢ | 4.87½¢ |
| Galvanized, 25 to 26 | ₩ lb 5.60¢ | 5.25 ¢ |
| Galvanized, 27 | ₩ lb 6.00¢ | 5.62½¢ |
| Galvanized, 28 | ₩ lb 6.40¢ | 6.00 ¢ |
| Patent Planished | ₩ lb A 10¢ | B, 9¢ |
| Russia | ₩ lb 9½¢ @ 10¢ | |
| American Cold Rolled B. B. | ₩ lb 5¢ @ 7¢ | |

#### English Steel from Store.

Best Cast ..... ₩ lb 15 ¢
Extra Cast ..... ₩ lb 16½ @ 17 ¢
Swaged, Cast ..... ₩ lb 16 ¢
Best Double Shear ..... ₩ lb 15 ¢
Blister, 1st quality ..... ₩ lb 12½¢
German Steel, Best ..... ₩ lb 10 ¢
2d quality. ..... ₩ lb 9 ¢
3d quality ..... ₩ lb 8 ¢
Sheet Cast Steel, 1st quality ..... ₩ lb 15 ¢
2d quality ..... ₩ lb 14 ¢
3d quality ..... ₩ lb 12½¢

### METALS.

#### Tin.

| | Per lb |
|---|---|
| Banca, Pigs | 28¢ |
| Straits, Pigs | 25 @ 26¢ |
| English, Pigs | 25¢ |
| Straits in Bars | 28¢ |

#### Tin Plates.

| | *Charcoal Plates.—Bright.* | Per box. |
|---|---|---|
| Melyn Grade | IC, 10 x 14 | $6.50 |
| " " | IC, 12 x 12 | 6.75 |
| " " | IC, 14 x 20 | 6.50 |
| " " | IC, 20 x 28 | 13.00 |
| " " | IX, 10 x 14 | 8.00 |
| " " | IX, 12 x 12 | 8.25 |
| " " | IX, 14 x 20 | 8.00 |
| " " | IX, 20 x 28 | 16.00 |
| " " | DC, 12½ x 17 | 6.00 |
| " " | DX, 12½ x 17 | 7.50 |
| Calland Grade | IC, 10 x 14 | 6.00 |
| " " | IC, 12 x 12 | 6.25 |
| " " | IC, 14 x 20 | 6.00 |
| " " | IX, 10 x 14 | 7.50 |
| " " | IX, 12 x 12 | 7.75 |
| " " | IX, 14 x 20 | 7.50 |
| Allaway Grade | IC, 10 x 14 | $5.25 @ 5.50 |
| " " | IC, 12 x 12 | 5.50 @ 5.75 |
| " " | IC, 14 x 20 | 5.25 @ 5.50 |
| " " | IC, 20 x 28 | 10.75 @ 11.00 |
| " " | IX, 10 x 14 | 6.25 @ 6.50 |
| " " | IX, 12 x 12 | 6.50 @ 6.75 |
| " " | IX, 14 x 20 | 6.25 @ 6.50 |
| " " | IX, 20 x 28 | 12.75 |
| " " | DC, 12½ x 17 | 5.00 @ 5.25 |
| " " | DX, 12½ x 17 | 6.00 @ 6.25 |

*Coke Plates.—Bright.*

| | | |
|---|---|---|
| Steel Coke. | IC, 10 x 14, 14 x 20 | $4.80 @ $4.85 |
| | 10 x 20 | 7.50 @ 7.75 |
| | 20 x 28 | 10.00 @ 10.25 |
| | IX, 10 x 14, 14 x 20 | 5.75 |
| BV Grade. | IC, 10 x 14, 14 x 20 | 4.70 @ 4.75 |

*Charcoal Plates.—Terne.*

| | | |
|---|---|---|
| Dean Grade. | IC, 14 x 20 | $4.62½ @ $4 75 |
| | 20 x 28 | 9.25 @ 9.50 |
| | IX, 14 x 20 | 5.62½ @ 5.75 |
| | 20 x 28 | 11.37½ @ 11.50 |
| Abecarne Grade. | IC, 14 x 20 | 4.50 @ 4.65 |
| | 20 x 28 | 9.00 @ 9 25 |
| | IX, 14 x 20 | 5.50 @ 5.75 |
| | 20 x 28 | 11.00 |

*Tin Boiler Plates.*

| | | |
|---|---|---|
| IXX, 14 x 26 | 112 sheets | $12.50 @ $12.75 |
| IXX, 14 x 28 | 112 sheets | 12 75 @ 13.00 |
| IXX, 14 x 31 | 112 sheets | 14.25 @ 14.50 |

#### Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

*Ingot.*

Lake..... 17¢ @ 17.50¢
"Anchor" Brand..... 16.50¢ @ 17¢

*Sheet and Bolt.*

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887.

| Not wider than | Not longer than | And longer than | Weights per square foot and prices per pound. Over 64 oz. | 32 to 64 oz. | 16 to 32 oz. | 14 to 16 oz. | 12 to 14 oz. | 10 to 12 oz. | 8 to 10 oz. | Less than 8 oz. |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 72 | | 25 | 25 | 25 | 26 | 27 | 28 | 31 | 33 |
| 30 | | 72 | 25 | 25 | 25 | 26 | 28 | 30 | 34 | ... |
| 36 | 96 | | 25 | 25 | 25 | 27 | 29 | 33 | 36 | .... |
| 36 | | 96 | 25 | 25 | 26 | 28 | 30 | 34 | 38 | .... |
| 48 | 96 | | 25 | 25 | 27 | 29 | 31 | 35 | .... | .... |
| 48 | | 96 | 25 | 25 | 28 | 30 | 32 | 36 | .... | .... |
| 60 | 96 | | 25 | 25 | 30 | 32 | 37 | .... | .... | .... |
| 60 | | 96 | 25 | 26 | 31 | .... | .... | .... | .... | .... |
| 84 | 96 | | 26 | 27 | .. | .... | .... | .... | .... | .... |
| 84 | | 96 | 27 | 28 | .... | .... | .... | .... | .... | .... |
| Over 84 in. wide | | | 28 | 30 | ... | .... | .... | .... | .... | .... |

| | 16 oz. | 14 oz. | 12 oz. | 10 oz. |
|---|---|---|---|---|
| All Bath Tub Sheets..... | | | | |
| Per pound..... | $0.28 | 0.30 | 0.32 | 0 35 |

Bolt Copper, ⅜ inch diameter and over, per pound..... 25¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

*Copper Bottoms, Pits and Flats.*

Per pound.
14 ounce to square foot and heavier..... 28¢
12 ounce and up to 14 ounce to square foot..... 29¢
10 ounce and up to 12 ounce..... 31¢
Circles less than 6 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

*Tinning.*

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢
Tinning sheets on one side, 20 x 60 each..... 30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each..... 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each..... 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each..... 12¢
Tinning sheets on one side, other sizes, per square foot..... 2½¢
For tinning both sides double the above prices.

*Planished Copper.*

Planished Copper List..... See Trade Report.

#### Brass and Copper Tubes.

| Seamless Copper. | | Seamless Brass. | |
|---|---|---|---|
| ⅝ inch ₩ ft..... | 50¢ | ⅝ inch ₩ ft..... | 47¢ |
| ½ " " ..... | 44¢ | ½ " " ..... | 41¢ |
| ⅜ " " ..... | 42¢ | ⅜ " " ..... | 39¢ |
| ¾ " " ..... | 40¢ | ¾ " " ..... | 37¢ |
| ⅛ " " ..... | 39¢ | ⅛ " " ..... | 36¢ |
| 1 " " ..... | 37¢ | 1 " " ..... | 34¢ |
| 1½ " " ..... | 34¢ | 1½ " " ..... | 31¢ |

#### Roll and Sheet Brass.

Discount from list..... 10 @ 15 %

#### Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.
Western Spelter..... 5¾¢
"Bergenport"..... 8¼¢
"Bertha"..... 7¾ @ 8¢

#### Zinc.

Duty; Sheet, 2½¢ ₩ lb.
600 lb casks..... 6¾¢
Per lb..... 7 @ 7½¢

#### Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

| | |
|---|---|
| American | @ 4¾¢ |
| Newark | @ 4¾¢ |
| Bar | @ 5 ¢ |
| Pipe | 7¾¢, dis 20 % |
| Tin-Lined Pipe | 15¢, dis 20 % |
| Block Tin Pipes | 53¢, dis 20 % |
| Sheet | 8½¢, dis 20 % |

#### Solder.

½ @ ½ (Guaranteed)..... 23¢
Extra Wiping..... 30¢
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

#### Antimony.

Cookson..... ₩ lb 14¢
Hallett's..... " 12¢

#### Plumbers' Brass Work.

| | Discount per cent. |
|---|---|
| Ground Bibbs and Stops | 55&10&2 |
| Ground Stops, Hydrant Cocks, &c. | 55&10&2 |
| Corporation Cocks | 55&10&2 |
| Corporation Cocks, "Mueller" Pattern, from Western list | 55&10&2 |
| Ground Basin and Shampooing Cocks | 50&10&2 |
| Compression Basin Cocks | 50&10&2 |
| Compression Basin and Sink Cocks | 50&10&2 |
| Compression Pantry Cocks | 50&10&2 |
| Compression Double Basin and Shampooing Cocks | 50&10&2 |
| Compression Double Bath Cocks | 50&10&2 |
| Compression Bibbs, Urinal Cocks, Fill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks | 50&10&2 |
| Basin Plugs and Basin Grates | 55&10&2 |
| Bath and Wash Tray Plugs | 55&10&2 |
| Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets | 55&10&2 |
| Basin Clamps, Basin Joints and Strainers | 55&10&2 |
| Boiler Couplings, Ground Face, per set $1.25 | dis 10 |
| Boiler Couplings, Plain Face, per set $1.20 | dis 10 |
| Water Back Valve and Plain Couplings, Soldering Nipples and Unions | 55&10&2 |
| Union Joints | 60&10&2 |
| Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides | 55&10&2 |
| Hose Goods | 55&10&2 |

#### Steam and Gas Fitters' Brass and Iron Work.

| | Discount per cent. |
|---|---|
| Brass Globe Valves | 60&10&2 |
| Finished Brass Globe Valves, with Finished Brass Wheels | 40&10&2 |
| Brass Globe Valves, with Patent Wood Wheels | 60&10&2 |
| Brass Globe Angle and Corner Valves | 60&10&2 |
| Brass Radiator Angle Valves | 60&10&2 |
| Brass Radiator Angle Valves, Frink's Patent | 60&10&2 |
| Brass Cross and Check Valves | 60&10&2 |
| Brass Check Valves | 60&10&2 |
| Brass Hose Valves | 60&10&2 |
| Brass and Iron Frink Valves | 60&10&2 |
| Brass Safety Valves | 60&10&2 |
| Brass Vacuum Valves | 50&10&2 |
| Brass Whistle Valves | 60&10&2 |
| Brass Balance, Back Pressure and Foot Valves | 50&10&2 |
| Brass Butterfly and Throttle Valves | 50&10&2 |
| Brass Pump Valves | 50&10&2 |
| Brass Steam Cocks | 57½&10&2 |
| Brass Service, Meter and Union Meter Cocks | 57½&10&2 |
| Brass Whistles, Water Gauges and Oil Cups | 60&10&2 |
| Brass Hollow Plug, Tallow and Globe Oil Cups | 50&10&2 |
| Brass Lubricators | 60&10&2 |
| Brass Air Valves | 60&10&2 |
| Brass Air Cocks | 60&10&2 |
| Brass Gauge Cocks | 55&10&2 |
| Brass Cylinder Cocks and Steam Bibbs | 50&10&2 |
| Brass Swing Joints and Expansion Joints | 50&10&2 |
| Brass Test Pumps | 50&10&2 |
| Brass Steam Fittings, Rough | 60&10&2 |
| Brass Steam Fittings, Finished | 20&10&2 |
| Brass Union Joints | 60&10&2 |
| Brass Soldering Unions and Nipples | 55&10&2 |
| Brass Hose Fittings, Fusible and Boiler Plugs | 55&10&2 |
| Iron Body Globe, Angle, Cross and Check Valves | 65&10&2 |
| Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves | 65&10&2 |
| Iron Cocks, all Iron | 65&10&2 |
| All Iron Valves | 65&10&2 |

#### Miscellaneous.

| | Discount per cent. |
|---|---|
| Cast Iron Fittings | 70&10 |
| Plugs and Bushings | 75&10 |
| Malleable Iron Unions | 67½ |
| Malleable Iron Fittings | 25&10 |

#### Paints.

| | |
|---|---|
| Black, Lamp—Coach Painters' | ₩ lb 22 @ 24¢ |
| " Ordinary | 6¢ |
| Black, Ivory Drop, fair | 12 @ 15¢ |
| " best | 20¢ |
| Black Paint, in oil.....kegs, 8¢; assorted cans, | 11¢ |
| Blue, Prussian, fair to best | 40 @ 55¢ |
| " " " in oil | 45 @ 55¢ |
| " Chinese dry | 70¢ |
| " Ultramarine | 18 @ 30¢ |
| Brown, Spanish | 1¼¢ |
| " Van Dyke | 10 @ 12¢ |
| Dryers, Patent American...ass'd cans, 9¢; kegs, | 7¢ |
| Green, Chrome | 15 @ 22¢ |
| Green, Chrome in oil | 14 @ 18 @ 25¢ |
| Green, Paris | good, 20¢; best, 25¢ |
| Green, Paris in oil | good, 30¢; best, 35¢ |
| Iron Paint, Bright Red | ₩ lb 2½¢ |
| Iron Paint, Brown | ₩ lb 1½¢ |
| Iron Paint, Purple | ₩ lb 3¢ |
| Iron Paint, Ground in oil, Bright Red | ₩ lb 6½¢ |
| Iron Paint, Ground in oil, Red | ₩ lb 5½¢ |
| Iron Paint, Ground in oil, Brown | ₩ lb 5½¢ |
| Iron Paint, Ground, Purple | ₩ lb 6¢ |
| Litharge | 8½¢ |
| Mineral Paints | 2 @ 4¢ |
| Orange Mineral | 10¢ |
| Red Lead, American | 6½¢ |
| Red Venetian (Eng.) dry | $1.65 @ $1.70 |
| Red Venetian in oil.....ass't'd cans, 11¢; kegs, | 8¢ |
| Red Indian Dry | 9 @ 12¢ |
| Rose Pink | 10 @ 13¢ |